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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

JJ-001US

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

10/089733

INTERNATIONAL APPLICATION NO.
PCT/US00/27480

INTERNATIONAL FILING DATE
04 OCTOBER 2000

PRIORITY DATE CLAIMED
05 OCTOBER 1999

TITLE OF INVENTION

Method and Apparatus for Delivering Dissimilar Entertainment and Advertising Content to a Plurality of Subscribers

APPLICANT(S) FOR DO/EO/US

Jack I. J'maev

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ has been communicated by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is attached hereto.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are attached hereto (required only if not communicated by the International Bureau).
 - b. ☐ have been communicated by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☐ Other items or information:

J'maev, Jack 45,669
Dckt: JJ-001US
Expr ET617840249US

U.S. APPLICATION NO. 10/089733 37 CFR 1.53		INTERNATIONAL APPLICATION NO. PCT/US00/27480		ATTORNEY'S DOCKET NUMBER JJ-001US	
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21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY	
				\$ 710.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$ 0.00	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$	
Total claims	28 -20 =	8	x \$18.00	\$ 144.00	
Independent claims	8 -3 =	5	x \$84.00	\$ 420.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$280.00	
TOTAL OF ABOVE CALCULATIONS =				\$ 1,274.00	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				+ \$ -637.00	
SUBTOTAL =				\$ 637.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$ 637.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	
TOTAL FEES ENCLOSED =				\$ 637.00	
				Amount to be refunded: \$	
				charged: \$	

a. ☒ A check in the amount of \$ 637.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☐ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
 overpayment to Deposit Account No. _____. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card**
information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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 Dckt: JJ-001US
 Expr ET617840249US

SIGNATURE _____
 Jack I. J'maev
 NAME _____
 45,669
 REGISTRATION NUMBER _____

34 prts

10/089733
JC13 Rec'd PCT/PTO 03 APR 2002

PRELIMINARY AMENDMENT

Sir:

Please amend the application as follows:

In the Claims:

Please cancel Claims 1 (one) through 18 (eighteen).

Please cancel Claims 23 (twenty-three) through 29 (twenty-nine).

Please amend Claim 30 as follows:

30. (Amended) A method for disseminating program content to a plurality of subscribers comprising the steps of:

- receiving advertising content into a cache;
- receiving entertainment content from a broadcast source;
- identifying insertion opportunities for advertising content in the entertainment content;
- directing the entertainment content to a subscriber by way of a virtual conduit;
- interrupting the entertainment content during identified insertion opportunities;
- retrieving an advertisement from the content cache;
- directing the advertisement by way of the virtual conduit to a subscriber in accordance with a delivery script so long as an advertising insertion opportunity persists; and
- resuming the direction of entertainment content by way of the virtual conduit to the subscriber once the advertising insertion opportunity desists.

Please amend Claim 33 as follows:

33. (Amended) A method for disseminating program content to a plurality of subscribers comprising the steps of:

- receiving advertising content into a cache;

83. (Amended) A targeted media server comprising:

- cache for receiving advertising content;
- cache for receiving entertainment content;
- insertion indicator that determines when insertion of advertising content is permissible and asserts an insert signal when it is permissible to insert advertising content;
- stream multiplexer that selects a content stream emanating from the cache for entertainment content when the insert signal is not asserted and selects a content stream from the cache for advertising content when it is asserted; and
- virtual conduit unit that creates a virtual conduit to a subscriber for carrying the content stream selected by the stream multiplexer.

Please cancel Claim 84 (eighty-four).

Please cancel Claims 91 (ninety-one) through 97 (ninety-seven).

Please add the following new claims:

98. (New) A target distribution server comprising:

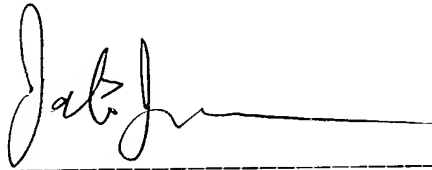
- receiver that receives entertainment content;
- entertainment content selector that selects entertainment content according to a programming request received from a subscriber;
- stream multiplexer that assembles said selected entertainment content into a content stream; and
- virtual conduit unit that forms a logical conduit leading from the target distribution server to the subscriber that conveys the content stream from the target distribution server to the subscriber.

99. (New) The apparatus of Claim 98 wherein the stream multiplexer further receives and injects broadcast advertising spots into the content stream wherein the entertainment content is received from a broadcast source.

100. (New) The apparatus of Claim 98 wherein the stream multiplexer further receives and injects directed advertising spots according to a demographic code corresponding to the subscriber into the content stream wherein the entertainment content is received from a broadcast source.

101. (New) The apparatus of Claim 98 wherein the stream multiplexer further receives and injects directed advertising spots according to a demographic code corresponding to the subscriber into the content stream wherein the entertainment content is received from an on-demand cache.

Respectfully Submitted,



Jack I. J'maev

Reg. No. 45,669

AMENDED CLAIMS SHOWING REVISION MARKS

30. (Amended) A method for disseminating program content to a plurality of subscribers comprising the steps of:

- receiving advertising content into a cache;
- receiving entertainment content from a broadcast source;
- identifying insertion opportunities for advertising content in the entertainment content;
- directing the entertainment content to a subscriber by way of a virtual conduit;
- interrupting the entertainment content during identified insertion opportunities;
- retrieving an advertisement from the content cache;
- directing the advertisement by way of the virtual conduit to a subscriber in accordance with a delivery script so long as an advertising insertion opportunity persists; and
- resuming the direction of entertainment content by way of the virtual conduit to the subscriber once the advertising insertion opportunity desists.

33. (Amended) A method for disseminating program content to a plurality of subscribers comprising the steps of:

- receiving advertising content into a cache;
- receiving entertainment content into a cache;
- identifying insertion opportunities for advertising content in the entertainment content;
- retrieving the entertainment content from the cache and directing it to a subscriber by way of a virtual conduit;
- interrupting the entertainment content during identified insertion opportunities;
- retrieving an advertisement from the content cache;
- directing the advertisement by way of a virtual conduit to a subscriber in accordance with a delivery script so long as an advertising insertion opportunity persists; and

resuming the direction of entertainment content by way of a virtual conduit to the subscriber once the advertising insertion opportunity desists.

68. (Amended) An apparatus for delivering dissimilar program content to a plurality of subscribers comprising:

[facility comprising:]

target distribution server that:

receives a programming request[s] from a [plurality of] subscriber[s];
selects entertainment content [for each of the plurality of subscribers] according to the received request[s];
assembles said entertainment content into a [plurality of] content stream[s] where there is one content stream for each subscriber;
and
emanates the plurality of content streams]; and
forms a [plurality of] logical conduit[s] leading from the [facility] target distribution server to [each of] the [plurality of] subscriber[s] that [accepts] conveys [a] the content stream [for the corresponding subscriber] from the target distribution server to the subscriber.

79. (Amended) A targeted media server comprising:

cache for receiving advertising content;
broadcast entertainment receiver;
insertion indicator that determines when insertion of advertising content is permissible and asserts an insert signal when it is permissible to insert advertising content; [and]
stream multiplexer that [selects one of a plurality of content streams from either the broadcast entertainment receiver or the cache for receiving advertising content and that] selects a content stream emanating from the broadcast entertainment receiver when the insert signal is not asserted and

selects a content stream from the cache for advertising content when it is asserted[.]; and
virtual conduit unit that creates a virtual conduit to a subscriber for carrying the content stream selected by the stream multiplexer.

83. (Amended) A targeted media server comprising:

cache for receiving advertising content;
 cache for receiving entertainment content;
 insertion indicator that determines when insertion of advertising content is permissible and asserts an insert signal when it is permissible to insert advertising content; [and]
 stream multiplexer that selects [one of a plurality of content streams from either the cache for receiving entertainment or the cache for receiving advertising content and that selects] a content stream emanating from the cache for entertainment content when the insert signal is not asserted and selects a content stream from the cache for advertising content when it is asserted[.]; and
virtual conduit unit that creates a virtual conduit to a subscriber for carrying the content stream selected by the stream multiplexer.

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**METHOD AND APPARATUS FOR DELIVERING DISSIMILAR
ENTERTAINMENT AND ADVERTISING CONTENT TO A PLURALITY OF
SUBSCRIBERS**

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RELATED APPLICATIONS

This application claims priority to its provisional parent "SYSTEM, METHOD, AND ARTICLE OF MANUFACTURE FOR DELIVERING DISSIMILAR ENTERTAINMENT AND ADVERTISING CONTENT TO A PLURALITY OF SUBSCRIBERS" filed on
10 October 5, 1999 and having received an application number of 60/157,713.

FIELD OF THE INVENTION

15 The present invention relates to the broadcast industry, the blossoming on-demand content delivery industry and the delivery of demographically targeted commercial messages.

BACKGROUND OF THE INVENTION

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The broadcast industry develops revenue by selling advertising time. In the prior art, broadcasters prescribe the programming that a particular channel will carry. Subscribers tune to various channels until they find a program that suits their taste and interest. The advertisers buy segments of time wherein they proclaim the virtues of their product or service or perhaps convey
25 some other message. The advertisements that they present are called "spots".

The industry has remained fundamentally unchanged for decades. Programs plans for channels are constantly modified in hopes of capturing a larger segment of the market. Advertisers buy spots in prime program intervals in hopes of maximizing the exposure of their advertisements.

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Even still, the advertisers have very little control over the types of subscribers that will see their ads. Very little has been achieved in segmenting the advertising venue along demographic lines. Such segmentation would maximize the chance that advertisements would be seen by interested parties rather than by a disinterested mass.

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Prior art has attempted to segment viewers by developing specialized channels. This has led to a class based advertising paradigm. Sporting goods could be advertised on a sports channel while office products could be advertised on business channel. What is really needed is the ability to selectively advertise to subscribers that are not only in an interest class, but to those that are specifically interested in the advertisers product. By allowing advertisers to direct their message to subscribers based on detailed demographic data would ensure that the advertiser would achieve the best possible result. A side benefit would be that more advertising could be supported by the broadcast channel since each subscriber would have a specific advertisement even though they are watching the same channel.

15

Achieving this type of demographically specific advertising, a notion called "pointcasting", required the development of innovative distribution techniques. Pointcasting is not a new notion. Attaining true pointcasting, though, requires extensive bandwidth on a medium so that every subscribers could be addressed individually.

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The cable television industry is a fine example of how pointcasting could be applied. A typical cable television system distributes program content on a single cable. That cable is routed to a plurality of subscribers and delivers the same content to each subscriber. Since each subscriber could conceivably be demographically diverse, it goes without saying that to achieve pointcasting on a cable television distribution network, the network would need to be able to deliver dissimilar content to each subscriber. A typical cable television system may serve over 10,000 subscribers. This then implies that 10,000 channels would have to be carried on the cable. With most distribution system capable of carrying only a hundred channels or so, cable television systems simply does not have the bandwidth to accomplish pointcasting.

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SUMMARY OF THE INVENTION

The present invention is a method and apparatus that provides pointcast capability to a plurality of subscribers that is fully expandable. The subscriber base is segmented into a plurality of facilities that each have a number of subscribers that can be readily accommodated by the bandwidth of a regular cable television system. Each facility receives direct broadcast of entertainment content either from the cable televisions backbone, from satellite feeds or from off-air sources. Each of the plurality of facilities digitizes and compresses the entertainment content and forms a plurality of content streams and then uses multi-state modulation develop modulated content streams. The modulated content streams are then converted to different frequency bands before they are delivered to the distribution network.

Each facility is connected to a distribution center. The distribution center dispatches both entertainment content and advertising spots to the plurality of facilities where it is stored in "pointcast" servers. The distribution center can transmit the content either by way of computer readable media or it can electronically mail the content to the facilities. A file server in each of the plurality of facilities builds scripts of advertising spots for each subscriber based on *a priori* demographic data. The advertisers specify which subscribers they want to target and with what promotional material. Before the broadcast entertainment content is compressed, demographically targeted advertising spots are injected into the digital content data to form seamless content stream. The entertainment content is then delivered to the distribution network.

For VOD service, pointcast servers in the plurality of facilities respond to real-time requests from the subscribers. Entertainment content is stored in the pointcast server and is accessed in a random manner. The pointcast server delivers compressed and modulated entertainment content. This content is then converted to a distinct frequency band and delivered to the subscriber by way of the distribution network.

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Advertising content and entertainment content are managed through the use of content descriptors. For commercial advertisement, the content descriptors comprise such information as the date and time that an advertisement should be presented as well as demographic codes and presentation strategy indicators that facilitate their targeted distribution. Entertainment
5 content descriptors comprise start and end dates as well and further comprise information regarding when and if advertisements can be aired during the presentation of the entertainment content.

The major processing thread associated with advertising is the creation of delivery scripts for
10 each of a plurality of users. For each subscriber, all of the commercial content descriptors are examined for presentation requirements. Advertisements that must air at specific, contractually required times and are broadcast in nature are assigned to each delivery script. Advertisements with less stringent presentation requirements are next assigned to each delivery script. Finally, directed advertisements are assigned to each subscribers delivery script commensurate with
15 demographic affiliated with each individual subscriber.

The targeted delivery server is a novel apparatus that embodies the present method of injecting advertising content. Using either insertion signals and/or codes and or timing epochs, the targeted delivery server supplants the entertainment content being delivered to a subscriber with
20 commercial content according to the delivery script. Otherwise, the targeted delivery server delivers entertainment according the requests received from the subscriber.

The overall system is based on the use of virtual conduits which is a bandwidth reservation scheme. This is an important element of the invention in that it assures that the distribution
25 network will always have adequate bandwidth to deliver dissimilar content to each and every subscriber. The targeted delivery server is comprises of broadcast receivers that have alternating buffers. Broadcast entertainment is fed into one of the buffers while the alternate buffer is available to provide broadcast content to a plurality of stream packers. The stream packers are comprised of multiplexers that select the output of the broadcast receivers. The enhanced

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targeted deliver server can select broadcast programs based on subscriber requests just like the standard server but can also inject demographically targeted advertisements based on a delivery script.

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BRIEF DESCRIPTION OF THE FIGURES

The foregoing aspects are better understood from the following detailed description of one
5 embodiment of the invention with reference to the drawings, in which:

Fig. 1 shows how facilities are connected by way of a inter-facility computer network;

Fig. 2 illustrates the staging of entertainment and advertising content before it is dispatched to the
10 facilities;

Fig. 3 is a diagram showing how entertainment and advertising content is assembled into e-mail
attachments;

15 Fig. 4 presents the structure of a table that describes entertainment content packages;

Fig. 5 presents the structure of a table that describes commercial advertising content packages;

Fig. 6 is a flowchart showing the various operations associated with dispatching content to the
20 facilities in the present invention;

Fig. 7 presents the compliment of equipment in each facility that processes incoming content;

Fig. 8 is a flow diagram that shows the steps involved in receiving content at the plurality of
25 facilities;

Fig. 8A shows how broadcast subscribers leach content from common conduits.

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Fig. 17 describes the manner in which the content stream packer of Fig. 15 manages content streams based on packet descriptors;

Fig. 17A shows how one multi-state modulated channel carries a plurality of streams;

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Fig. 18 presents the internal structure of the frequency converter used in the plurality of facilities in the present invention;

Fig. 19 presents a diagram of the internal structure of a converter module used in the frequency converter of Fig. 18;

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Fig. 19A demonstrates how digital slope correction is accomplished;

Fig. 20 presents a typical prior art distribution system used in the prior art cable television system;

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Fig. 21 presents the structure of the digital-branch-node of the present invention used to upgrade the distribution system depicted in Fig. 20;

Fig. 22 depicts the segmentation of a cable television system into a plurality of facilities;

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Fig. 23 shows how subscribers with similar demographics can be grouped together into facilities and those facilities can be networked together;

Fig. 24 depicts the structure of a table that is used to assign streams to a plurality of subscribers;

25

Fig. 24A presents the internal structure of a reception unit;

Fig. 24B depicts a display unit;

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automobile manufactures, insurance carriers and the like. Facility "A" will also receive entertainment content specific for it's region and national entertainment content. Examples of regionally specific entertainment content could include pre-recorded local public access and informational channels. Each facility in a cable television system is similarly examined by the process in distribution center 10.

Fig. 3 demonstrates that once the content for each of the plurality of facilities 15 is identified, distribution center 15 composes a plurality of e-mail messages to effect the dispatch.

Distribution center 15 will collect all national entertainment content and advertising spots at attach these to one or more e-mail messages addressed to each of the plurality of facilities 15. Content bound only for a particular region will be collected together and attached to one or more separate e-mail messages addressed only to the appropriate facility 15. Hence, all of the plurality of facilities 15 will receive two or more e-mail messages; one or more for the national content and one or more for the regional content.

Processing Entertainment and Ad Content

Fig. 4 depicts entertainment content descriptor header 35. Distribution center 15 creates a plurality of entertainment content descriptors 35 corresponding to all entertainment content it receives. Entertainment content descriptor 35 comprises a plurality of entries including, but not limited to:

1. Title

This is the title of the entertainment content and can be either a title code or an actual alphanumeric title;

2. Start Date

This field defines the date that the content can not be presented before. This date field is populated with a value customarily provided by the content provider as a "do not show until" date;

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3. End Date

This field defines the date after which the content can not be presented. This field may be populated by an actual date indicating that presentation of the content is restricted after the date or it may include a null value. The null value indicates that the content can be presented on an indefinite basis;

4. Presentation Price

The Presentation Price field indicates to the amount of compensation the content provider expects to realize from every showing of the content;

5. Content Type

The content type field indicates if the entertainment content is a first run movie, a classic movie, audio-only content, or a computer animation game;

6. Spot Allowance

The spot allowance filed indicates the quantity of advertising spots that can be inserted into the entertainment content during a period of time. This field is ordinarily populated with a number such as "6 30-second spots per hour";

7. Store Address

The store address field is not populated by distribution center 10. This field is used by the facility 15 to store the address where the content is stored in a pointcast server;

8. Content Length

The content length indicates the run time, unedited, for the entertainment content;

9. Region

The region field indicates if the content can be presented nationally or if presentation is limited to a particular region. In the event that regional restrictions are applicable to the content, this field points to a list of regions 40 where the content can be presented.

Fig. 5 depicts the structure of commercial content descriptor 45. Distribution center 10 creates a plurality of commercial content descriptors 45 corresponding to the plurality of commercial advertising spots it receives. Commercial content descriptor 45 includes as a minimum the following fields:

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1. Spot Number

This is a numeric number of the spot that is assigned by the distribution center and is used for tracking the presentation history of the advertisement;

2. Start Date

5 The start date field indicates when the advertisement will initially be presented;

3. End Date

The end date field indicates when the advertisement will expire;

4. Presentation Level

10 The presentation level indicates how many time during a saturation window the advertisement will be presented;

5. Start Window

The start window field indicates the beginning of a time slot that the advertising content will be presented;

6. End Window

15 The end window field indicates the end of a time slot that the advertising content will be presented;

7. Presentation Strategy

20 Each advertisement received by distribution center 10 is categorized as either a broadcast advertisement or a pointcast spot. When the advertisement is a broadcast spot, this field contains a null value. Otherwise, a demographic code is stored in this field. The demographic code is used to direct the advertisement to target subscribers based on the demographic complexion of the subscriber;

8. Store Address

25 The store address field is not populated by distribution center 10. This field is used by the facility 15 to store the address where the content is stored in a pointcast server;

9. Store Length

The store length field indicates the running time, unedited, of the advertisement;

10. Region

The region field indicates if the content can be presented nationally or if presentation is

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Step 70 comprises the actual categorizing of the content. Distribution center 10 begins by creating content descriptors for each piece of content. For entertainment content, distribution center 10 creates a plurality of entertainment content descriptor 35 together with their subordinate region tables 40. For advertising content, distribution center 10 creates a plurality of commercial content descriptors 45 together with their subordinate spot-presentation-time 55 and spot-region 50 tables.

Most content arrives at distribution center 10 on analog media. Once a content descriptor for the newly arrived content is available, a computer based digitizer then digitizes the content and compresses it. The compresses digital content is then stored in a file along with it's corresponding content descriptor. The process for entertainment content and ad spots varies only by the type of information stored in the content descriptors.

Step 80 comprises communication with a security processor to obtain a cipher key. Security processor 25 maintains a list of ciphers that have limited temporal validity. Alternatively, the security processor 25 can generate cipher keys in a pseudo-random manner. Distribution center 10 uses the cipher key as a basis for encrypting all content stored in the compressed digital format.

Step 100 comprises the sorting of content according to delivery regions and presentation times. Distribution center 10 collects statistics about the reliability of the distribution of content over inter-facility computer network 20. Based on the reliability history, distribution center 10 allows sufficient time before content must be presented to subscribers to effect the dispatch of the content to the plurality of facilities. It does so by estimating the time required to transmit e-mail messages together with a plurality of content attachments and the time required by the plurality of facilities 15 to assimilate the content. Once content is identified as being timely for dispatch, it is sorted with other timely content and a list of recipients for each of a plurality of content will be created. This is accomplished by examining the presentation region field of each of the plurality

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of entertainment descriptors and their subordinate region tables and creating a recipient list of the facilities 15 that serve a particular region and must receive the content. Where the content is to be nationally presented, each of the plurality of facilities 15 will be placed in the recipient list for that content.

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Once the list of e-mail messages are created, distribution center 10 actually composes the e-mail messages. This is done by creating a plurality of e-mail messages corresponding to the content that must be delivered to the plurality of facilities 15. Each of these e-mail messages includes an attachment comprised of the entertainment descriptor and the actual digitized, compressed and encrypted content. These e-mail messages are then sent to all of the plurality of facilities 15 that are listed in the recipient list for that content.

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Facility Operation

15 Fig. 7 shows the internal structure of the facility content processing suite. The equipment required to process content at the plurality of facilities 15 comprises: 1) a plurality of pointcast servers 110; 2) a plurality of frequency converters 120; 3) a plurality of file servers 140; 4) an intra-facility computer network 150; and 5) network combiner 160.

20 Fig. 8 shows what steps are performed by the plurality of facilities 15 in order to receive content from distribution center 10. These steps comprise: 1) receiving e-mail messages with content attached (170); 2) fetching a fresh cipher key (180); 3) decrypting the content (190); and 4) storing the content in a pointcast server (200).

25 Step 170 is performed by file server 140. File server 140 receives content from distribution center 10 by means of it's interface to inter-facility computer network 20. File server 140 hosts an e-mail client that participates in standard web-based e-mail exchanges. File server 140 detaches the content from the e-mail message and stores that content in a disk file together with the content descriptor.

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Step 180 is also performed by file server 140. Periodically, file server 140 establishes a dial-up connection to security processor 25. Once the connection has been established, file server 140 retrieves a limited number of temporally valid cipher keys.

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Step 190, performed by file server 140, uses the cipher key to decrypt the secured content.

Step 200 is the last step in receiving content from distribution center 10. Once the content has been decrypted, it is stored in pointcast server 110. File server 140 uses the content descriptors
10 for all content received to determine the amount of memory required to store the content and where the content ought to be stored. File server 140 maintains a storage map of the content placed in pointcast server 110.

Once the content has been stored in pointcast server 110, file server 140 must then create the
15 pointcasting strategy for delivery of the advertising content received from distribution center 10. The plurality of facilities 15 provide one of two types of services to the subscribers; broadcast and entertainment-on-demand.

Figs. 8A and 8B contrast the distribution network used in the prior art with that of the true
20 "point-casting" paradigm that is part of the present invention. Prior art used a limited number of channels, or conduits, that each carried content to a plurality of subscribers. If more than one subscriber was desirous of viewing the same channel, that one conduit fed content to a plurality of subscribers. In pointcasting, even what would traditionally be called broadcast channels are made dissimilar by introducing demographically targeted advertisements. This means that each
25 and every subscriber would receives a different selection of advertisements event though the entertainment content would be identical.

Fig. 8B shows that the present invention establishes a distinct logical conduit to each and every subscriber. When the subscriber want to view a particular channel, the content from that channel

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is “funneled” into that specific conduit that leads directly to the subscriber. Logical conduits in the present invention equate to “content streams” that are composed in real-time by the pointcast server.

5 When compared to the prior art, the new paradigm immediately reserves the minimum bandwidth necessary to serve all subscribers irrespective of the type of service requested; broadcast or on-demand entertainment. In the prior art, bandwidth would need to be allocated to all of the broadcast channels that had dissimilar content and then this bandwidth would need to be dynamically reallocated to on-demand entertainment.

10

Fig. 9 presents a flow diagram that describes the process followed by the plurality of facilities 15 to develop the pointcasting strategy. These steps comprise: 1) receiving demographics about subscribers (210); 2) building delivery script tables for the broadcast channels for a plurality of subscribers (220); 3) assigning broadcast advertising spots to the broadcast channel delivery scripts for each of a plurality of subscribers (230); 4)) assigning pointcast advertising spots to the broadcast channel delivery scripts for each of a plurality of subscribers (240); 5) building demand-content delivery list for a plurality of subscribers (250); 6) assigning broadcast advertising spots to the demand-content delivery list for each of a plurality of subscribers (260); 7) assigning pointcast advertising spots to the demand-content delivery list for each of a plurality of subscribers (270).

15

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File server 140 receives demographic information for each of a plurality of subscribers either from distribution center 10 or other external sources. File server 140 can receive the demographic information either via e-mail, through an electronic interface such as a serial or parallel port or it can receive the demographic information by removable data disk.

25

Fig. 9A shows that the demographic data is received in the form of a list of subscribers wherein each subscriber has a plurality of demographic codes assigned to it. The number of demographic

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codes can be limited in order to preclude saturation of that subscriber and rendering the pointcast advertisements ineffective. Demographic information for the plurality of subscribers is stored in subscriber-demographic table 280.

- 5 Fig. 9 shows that the next step performed by file server 140 is step 220, building the broadcast delivery script tables. Fig. 10 shows the basic structure of the broadcast delivery script tables 290. A plurality of broadcast delivery script tables 290 are created, one for each of a plurality of subscribers serviced by facility 15.
- 10 On a periodic basis, file server 15 examines all of the commercial content descriptors 45 that it is managing at the time of the examination. This is normally accomplished once per day, but any period that is convenient for the cable television system can be accommodated. File server 140 discards any of the commercial content descriptors that have expired relative to the "end date" field of the descriptor. Contemporaneously, file server 140 purges the content linked to the
- 15 discarded content descriptors.

- File server 140 performs step 230 by examining the presentation strategy field of the remaining commercial content descriptors 45 to identify the descriptors that are truly require broadcast delivery of their content and the presentation time field in order to identify those commercials that
- 20 have mandatory presentation times. The "spot number" assigned to these commercial content descriptors 45 are then assigned to the mandatory time slots in each of the plurality of broadcast delivery script tables 290 according to the mandatory presentation times listed in the spot presentation times table 55 for that commercial content descriptors 45. Once the mandatory presentation spots are assigned, file server 140 then assigns the remaining broadcast spots
 - 25 according to their saturation level and their start and end time slot windows. The saturation level indicates the frequency that an advertisement must be presented to the subscribers in a given time interval. For example, an advertisement might need to be presented 5 times per day. The presentation window indicates during what portion of the day an advertisement must be

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spot-tables 300 based on the demographic code akin to the mechanism followed on step 240 described supra. This mechanism for interleaving broadcast ads with pointcast spots results in a round-robin apportionment of available advertising opportunities given the non-deterministic nature of on-demand content delivery. Whenever a subscriber requests on-demand entertainment, the demand-spot-table for each subscriber is used to determine which advertisement should be presented in the next available advertising opportunity or time slots.

Pointcast Server

Fig. 12 depicts the internal structure of the pointcast server 110. Each of the plurality of facilities 15 can have a plurality of pointcast servers. The number of pointcast servers is determined by the number of subscribers that each facility will serve and the number of subscribers may vary from facility to facility. Operation of pointcast server 110 is based on a plurality of processing cycles. The most basic cycle in pointcast server 110 is based on a quantum of time of presented video. For instance, the current embodiment uses a quantum of 1 millisecond. This means that all data transfers for entertainment content are either delivered to subscribers or discarded on that period. This basic cycle can almost be considered pointcast server 15's heartbeat. Compressed digital entertainment content is formatted into delivery packets of equal length, but the number of packets that constitute a time-length of content presented to subscribers can vary. This is known as variable bit-rate content. The heartbeat enables the circuitry in the pointcast server to deal with variable bit rate content in a deterministic manner.

Fig. 8B introduces the notion of a plurality of distinct virtual conduits emanating from the pointcast server to each of the plurality of subscribers. The pointcast server's primary function is to develop content streams for each of the plurality of subscribers that each facility 15 serves.

Fig. 12A demonstrate that the content stream for any subscriber "n" is composed by presenting some entertainment content, either broadcast or on-demand, and the introducing commercials into the content stream. The commercial to be inserted into the content stream is that commercial specified in the broadcast delivery script 290 for that subscriber for the given time slot. As

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shown in the figure, the first advertisement is specified by a "spot number" of "1". This corresponds to the spot number stored in the first ad slot in broadcast delivery script 290 beginning at midnight (00:00).

- 5 File server 140 determines which broadcast or on-demand content must be delivered to each of the plurality of subscribers. The entertainment content selection mechanism is described infra. File server 140 communicates to pointcast server 110 what content is to be delivered to each of the plurality of subscribers. File server manages the delivery of entertainment content and commercial content. The management process varies slightly between broadcast and on-demand
- 10 entertainment content delivery. For on-demand entertainment, file server 140 calculates the amount of entertainment content that must be delivered before the first commercial is presented. Based on this time, file server 140 indicates the length of content to be delivered to a subscriber. File server 140 then indicates the storage location of the content based on the base storage location of the content as stored in pointcast server's cache 310 plus any offset to account for the
- 15 elapsed time that the entertainment content has already been presented to the subscriber.

File server 140 then examines the demand-spot-table table 300 to determine what advertisement must be presented at the current time slot. File server 140 communicates to pointcast server 110 the location of the commercial content as stores in it's content cache 310 together with the length

20 of the commercial. This process continues continuously to form the content stream. File server 140 tags each of these content delivery commands with a virtual conduit number that corresponds to one of the plurality of subscribers.

For broadcast content, file server 140 uses information in the plurality of broadcast delivery

25 script tables 290 to select the commercials that are to be inserted into the broadcast content streams for each of the plurality of subscribers. When delivering on-demand entertainment, file server 140 calculates the amount of entertainment content that must be presented to the subscriber before inserting a commercial. For broadcast content, in contrast, file server 140 only specifies a queue of commercials that must be presented to each of the plurality of subscribers.

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Circuitry on cable tuner assembly 320 and satellite tuner 330 monitors the incoming content and presents an indicator that enables the insertion of local commercial content into the content stream.

- 5 Fig. 13 shows the structure of tuner assembly 320. Tuner assembly 320 comprises tuner 380; analog demodulator 390; video analog-to-digital converter 400; audio analog-to-digital converter 410; processor 420; memory 430; delivery interface 440; external content demand requestor 450; and multi-state demodulator 460.
- 10 In operation, tuner 380 is digitally tuned to an analog television station that it receives either from a cable television feed or of the air via an antenna. The output of the tuner is then fed to analog demodulator 390. Analog demodulator 390 will recover video and audio information from the modulated carrier received by tuner 380. The video and analog information is digitized by video and audio analog-to-digital converters 400 and 410 respectively. The digitized information is the
- 15 processed by processor 420 in accordance with a program stored in memory 430. Processor 420 compresses the video and audio information into a compressed video/audio data stream that it deposits in delivery interface 440. The current embodiment compresses the digitized entertainment into MPEG.
- 20 Alternatively, tuner 380 may be digitally tuned to receive a multi-state modulated digital channel that carries a plurality of entertainment content streams. Multi-state demodulator 460 demodulates the carrier and extracts the entertainment content streams. The entertainment content streams, which are received as time multiplexed packets, are forwarded by processor 420 to delivery interface 440. The present invention relies on a form of multi-state modulation
- 25 called quadrature amplitude modulation that defines a plurality of modulation states being combinations of quantum amplitudes and quantum phase shifts.

External content demand circuit 450 monitors the output of analog demodulator 390 for indicators that local commercials can be inserted into the content. The current embodiment uses

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a subcarrier tone to identify advertising insertion epochs but other indication mechanisms are possible. The output of content demand circuit 450 is made available to the plurality of content stream packers 340 integral to pointcast sever 110. When tuner assembly 320 is receiving digital content streams demodulated by multi-state demodulator 460, advertising opportunities are marked by a special data code embedded in the streams. In this case, content stream packers 340 monitor the content stream and when the advertising opportunity marks are discovered, local content is inserted into the content stream.

Delivery interface 440 serves two functions: first, it provides transfer elasticity and second it stores content so that it can be delivered to a plurality of subscribers. Elasticity is provided by means of two alternating buffers operating in a ping-pong fashion. While processor 420 is filling packets of compressed content into one of the buffers, content stream packers 340 are reading data from the other to satisfy their content delivery requirements. In order to satisfy the demand for content from a plurality of content stream packers 340, delivery interface maintains the content current so that any number of the plurality of content stream packers 340 can obtain the data. The alternating buffers ping-pong when the pointcast server's heartbeat, described about, ticks.

Fig. 14 shows that the satellite tuner assembly 330 used in pointcast server 110 is identical in structure to tuner assembly 320. The only difference betwixt the two is that tuner 320 on tuner assembly 320 is replaced with satellite tuner 470. Satellite tuner 470 is capable of receiving signals from earth-orbiting satellites. Aside from this, all other functions of satellite tuner assembly 330 remain identical to that of tuner assembly 320.

Fig. 12 shows that pointcast server's control processor 370 interfaces to the intra-facility computer network 150. Control processor 370 receives content delivery scripts for each of a plurality of content streams, one for each subscriber. The content delivery sequences comprise messages received from file server 140 that define what content is to be next presented to each of the plurality of subscribers. The character of the messages received from file server 140 is

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demonstrated in Fig. 12A and comprises an address of content stored in pointcast server's content cache 310 and a length value.

Content cache 310 stores entertainment and commercial content in a compressed digital format.

- 5 The compressed digital content is organized into packets of equal size. Hence, a segment of entertainment or commercial content is actually comprised of a plurality of equal length packets.

Fig. 17 shows that alternate embodiments with non-equal length packets can be readily accommodated by packet descriptor 600 used by content stream packer 340. Control processor 370 calculates the physical address of each packet that comprises a segment of content that must be next presented to each of the plurality of subscribers. Control processor 370 creates a plurality of packet descriptors 600 in it's own local memory for a plurality of content segments for a plurality of content streams. Packet descriptors include the address of the content packet as stored in content cache 310, the length of the packet, the type of the packet and the address of the next packet descriptor as stored in control processor's 370 local memory. Content streams correspond to a virtual conduit from the pointcast server to each of the plurality of subscribers.

- Fig. 17A shows that each of the plurality of content stream packer 340 used in pointcast server 110 generates a multi-state modulated channel comprising a plurality of streams. Hence, each modulated channel serves a plurality of subscribers. As shown in the figure, "n" content streams are carried in the channel. In the present invention, content stream packer 340 collects ten streams to form a channel. The number of streams that can be collected into a multi-state modulated channel is based on the bit-rate of the content stream and the aggregate capacity of the channel to carry digital data.

Control processor 370 controls the sequence of content delivery by dispatching the address of the first packet descriptor for each of a plurality of streams to content stream packer 340. Referring to Fig. 15, content stream packer 340 receives the plurality of packet descriptors 600

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in to its queue management circuit 480. Queue management circuit 480 comprises control circuits and a plurality of stream organizers. Each of the plurality of stream organizers manages a single content stream. A stream organizer fetches a packet of content from content cache 310 and stores the packet into a corresponding stream FIFO (first-in-first-out) memory 490. Stream organizers also tags each packet with a stream identification number that corresponding to a subscriber. The identification number is stored in FIFO memory 490 immediately before the packet. This stream identification number is used by the content reception unit at each subscriber to select a content stream for presentation to the subscriber.

10 The control circuits comprising queue management circuit 480 move the packets, and their corresponding stream identification numbers, from FIFO memory 490 into stream multiplexer 500. Stream multiplexer 500 interleaves the packets and delivers them to forward error correction unit 510. Forward error correction unit 510 accepts parallel data from stream multiplexer 510, generates error correction and detection syndromes and wraps the packet data and the syndromes in a transport package. The transport package is then directed to multi-state modulator 520 which modulated the time division multiplexed content streams onto an intermediate frequency carrier channel. The intermediate frequency carrier channel is filters by filter 530 to remove unwanted aliases created by the digital modulation techniques used by multi-state modulator 520. In the present invention, forward error correction unit 510 and multi-state modulator 520 are embodied together in a single integrated circuit.

Referring to Fig. 17, once the packets are moved by the stream organizer in queue manager circuit 480 into FIFO memory 490, the control circuit in queue manager circuit 480 fetches the next packet descriptors for each of the plurality of streams from control processors 370 local memory and processes the next packets for the plurality of streams. These time-division-multiplexed packets then form a multi-state modulated channel as shown in reference number 610.

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Fig. 12 shows that pointcast server 110 includes disk controller 360 and disk farm 365. Prior art content servers have used a plurality of disk drives using striping techniques to delivery content directly to a content stream packer. The prior art has two distinct disadvantages that the present invention cures. First, the use of disk drive for direct content delivery is unreliable. Data read from disk drives is susceptible to errors. In the event that errors are detected, the latency of the rotating media is so excessive that the content stream packer will experience a data under run. This under run results in loss of synchronization at the subscriber that is manifest as a momentary frozen display screen. Disk drives are also unreliable in that they are mechanical devices. Delivery of entertainment content requires high utilization factors of the disk drives. This results in a severely abbreviated useable life of the disk drives and they must be replaced frequently. The second disadvantage associated with using disk drive for direct content delivery is that the striping techniques used to increase content retrieval bandwidth requires significant management of the streams. A plurality of high speed processors are required to manage the access to the packets stored on the disk drives.

The present invention's pointcast server 110 stores the packets that comprise content segments in high bandwidth random access memory. The random access memory is not plagued by disk-read errors and hence, the presentation of "frozen screens" due to lost packets to subscribers is mitigated. Use of random access memory for delivery of packets to the plurality of content stream packers 340 requires less processor management because the packets are not interleaved on striped disks and are stored in deterministic memory locations. Random access memory has almost two orders of magnitude more bandwidth for content retrieval. This means that more subscribers can be serviced simultaneously.

Digital entertainment content is extremely voluminous. The present invention provides a content cache that stores 30 full-length movies and a commercial content for one hour of presentation to a plurality of subscribers. The amount of content that the current embodiment can manage is presented only for the purpose of demonstrating typical sizes. The amount that can be managed can be varied as advertising and programming requirements change.

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Control processor 370 receives both entertainment content and commercial content from file server 140 on a periodic basis. Control processor also receives entertainment content descriptor 35 and commercial content descriptor 45 for each of the plurality of content segments it receives from file server 140. Control processor 370 stores the content and the descriptors onto disk drives in disk farm 365 using conventional disk file management techniques. When pointcast server 110 first powers up, or when a reboot is required, control processor 370 creates a memory map that indicates what content is to be stored at what memory address location based on the load addresses specified in the content descriptors 35 and 45. Control processor 370 commands disk controller 360 to copy the content from disk farm 365 to the random access memory comprising content cache 310 in accordance with the memory map.

Not all of the content is copied directly from disk farm 365 to content cache 310. File server 140 indicates to control processor 370 what commercial content will be needed to form content streams in the upcoming period. Control processor 370 moves only that select set of entertainment content to the content cache. By moving the digital content to content cache 310 based on a priori knowledge of what content will be required in the upcoming period, the amount of random access memory needed to store content is reduced. In the present invention, the digital representation of advertisements that will be presented to a plurality of subscribers in the upcoming hour are copied to content cache 310.

The disk farm is likely to store entertainment content that will not always be presented to the subscribers. Popular entertainment content is copied to content cache 310 so that a multiplicity of demands for that content can be serviced. Other content, such as classic movies, may be stored in disk farm 365 and copied to content cache 310 only as needed. In a typical cable television system, the menu of on-demand entertainment that a subscriber can select from may include popular movies that are always available and a selection that varies with the time of day. For instance, some on-demand content may only be available late at night (adult entertainment) or early in the morning (children's programming or educational programs). The size of disk farm

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365 and content cache 310 can be varied to accommodate the needs of different facilities within the network.

5 *Frequency Converter*

Fig. 7 shows that the output of pointcast server 110 is a plurality of multi-state modulated channels. As described supra, these multi-state modulated channels are modulated onto an intermediate frequency carrier. The plurality of intermediate frequency carriers are directed into frequency converter and combiner 120. In order to distribute the plurality of multi-state

10 modulated intermediate frequency carriers to a plurality of subscribers, they must be converted to different carrier frequencies so that they can coexist on a single cable capable of propagating RF signals.

Fig. 18 shows the internal structure of frequency converter and combiner 120 comprising a

15 plurality of converter modules 650, a low phase noise oscillator 660 a passive combiner 680 and a control processor 670.

Multi-state modulated carriers are susceptible to errors induced by excessive phase or amplitude jitter. In order to mitigate the amount of noise, any frequency conversion must be based on

20 stable frequency references. Not atypical of the stability required for such conversions would include a reference oscillator with phase noise of less than -120 dB. Such low phase noise references are costly. Frequency converter and combiner 120 uses a common low-noise oscillator 660 frequency reference that is disseminated to a plurality of converter modules 650.

25 The outputs of the plurality of converter modules 650 will be multi-state modulated carriers centered at distinct frequencies. These are then combined in passive combiner 680. A passive combiner is used to reduce the likelihood that the all channels will not be propagated due to the failure of a common active component. Passive combiner 680 includes an upstream input. A

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processor 670 uses the coefficients to correct readings obtained by power meter 750 and to convert them to useful engineering units such as dBm.

5 Network combiner 160 (on Fig. 7) comprising a duplex filter combines the base-band component of a computer network connected to file server 140 with the RF component that is generated by the frequency converter and combiner 120. This composite spectrum is then distributed by the distribution system.

Facility Distribution

10 Fig. 20 illustrate that a typical cable television distribution system carries programming content, normally analog modulated television and radio signals, from a head-end source and disseminates the signals throughout a neighborhood. A branch-node 850 amplifies 860 the signals and then splits 870 the signal by dividing the power down a plurality of branches. This branching scheme is replicated to the extent required to service a plurality of subscribers 880. In the previous art,
15 each subscriber 880 simply selected a broadcast channels from among a plurality of channels available on the distribution cable 890. The subscriber used a television set to tune to the desired channel.

In the new paradigm of the present invention, each of the subscribers is assigned a virtual conduit
20 and programming content, including entertainment and commercials, is funneled to the specific subscriber. Subscribers can not longer passively tune to a channel to receive content.

Subscribers must replace their television sets with a digitally capable reception unit. The digitally capable reception unit still presents the traditional "channel surfing" paradigm to the subscriber 880, but instead of passively tuning to a channel, the digital reception unit sends a request back to
25 file server 140 indicating that different content must be funneled into the virtual conduit for that subscriber.

The need for communicating content requests back to file sever 140 requires a modification to the existing distribution system. And most notably, the branch-node 850, which is a unilateral

device, must be replaced by a digital-branch-node 900. Digital branch node 900 enables the amplification of RF channels akin to it's predecessor, but it also enables the propagation of a computer network in the base-band portion of the cable's spectrum.

Cable Television Installation

In the prior art, a cable television system would deliver the same content to all subscribers within their network. Any advertisements that were to be presented to the community would be

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Custom Distribution Networks

Fig. 23 demonstrates how the present invention is used in the establishment of specialized broadcasting networks, specifically to a hospital or elderly care center. The concept includes the development of custom broadcasting networks based on targeting subscribers that are demographically similar.

Subscribers need not be homes in a neighborhood. Subscribers may be hospital beds as described in one preferred embodiment. The facility equipment of Fig. 7 is installed at a plurality of hospitals, elder care facility, retirement complexes to establish a custom distribution network catering to the sick, elderly and retired. The custom distribution network presents demographically targeted advertising to a plurality of subscribers at those facilities.

The custom distribution network operates as a national cable television system and sells advertising spots to pharmaceutical companies and others based on the demographics supplied by hospital computers. This ensures that hospital patients that are suffering from a particular illnesses will be presented with advertisements for medicines that they could consider taking. In this situation, hospital computers interface with file server 140 to ensure that any targeted advertising meeting with the approval of a patient's physician. This is done by filtering the advertisements for certain drugs or services from the broadcast delivery script 290 and on-demand-spot table 300 for a particular patient. As another example, patients that need physical therapy will be exposed to advertisements from rehabilitation clinics proximate to the patient's home address as received from the hospital's computer. The custom distribution network also includes specialized entertainment content that serves as rehabilitation training for patients recovering from particular procedures.

The hospital environment shown in Fig. 23 requires a specialized reception unit.

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- up, CPU 1330 communicates with file server 140 to discover what virtual conduit must be selected for the instant subscriber. File server 140 responds to the request with a channel number and stream number as stored in the cross reference list 1200. CPU 1330 then commands RF tuner 1270 to digitally tune to the channel identified by file server 140. CPU
- 5 1330 commands DMA controller 1290 to extract only the one content stream from that channel as identified by file server 140.

- Once RF tuner 1270 tunes to the required RF channel, multi-state demodulator 1280 begins to demodulate the multi-state modulated carrier. Multi-state demodulator 1280 performs forward
- 10 error correction and extracts data from the carrier package. Multi-state demodulator 1280 delivers discrete packets of compressed digital entertainment content wherein each packet is identified by a stream number. DMA controller 1290 collects the data packets that correspond to the stream number assigned to the instant subscriber and stores same into memory 1300.

- 15 Once DMA controller stores packets of compressed digital content in memory 1300, it notifies, by interrupt, CPU 1330 that content is available. CPU 1330 responds to DMA controller's 1290 interrupt by executing a sequence of instructions that enable CPU 1330 to de-compress the instant data packet. CPU 1330 decompresses a plurality of data packets to form a screen of video content and a segment of audio content. CPU 1330 commands graphics controller 1310
- 20 to display the video content on a display. Graphics controller 1310 provides digital video signals or analog video signals to either a digital video monitor or to an analog display unit. CPU 1330 moves the decompressed audio content to audio digital-to-analog (D/A) converter 1320. Audio D/A 1320 then provides an analog signal to a speaker that represents the audio information.

- 25 Reception unit 1250 includes a key-sense interface 1370. Key sense interface 1370 senses key activation from a subscriber (human user). These key activation events correspond to channel surfing instructions. When CPU 1330 recognizes a key-activation, it communicates a channel request to file server 140 using network interface 1350. Network interface 1350 gains access to the base-band spectrum of the distribution cable by means of diplex filter 1260. File server 140

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responds to the channel request by feeding different entertainment content into the virtual conduit assigned to the instant subscriber.

Fig. 24B shows that the analog display unit comprises an NTSC video modulator 1400. NTSC video modulator accepts the analog video and audio signals from reception unit 1250 and forms an NTSC modulated signal. The NTSC modulated signal is then fed to a television receiver for final presentation to the subscriber.

Fig. 24C shows that the key-senses are initiated by either a keyboard or an infra-red remote control receiver, both or either of which may be mounted proximate to the reception unit 1250. Keyboard 1410 comprises several numeric keys, up-down channel surfing keys and an enter key. Said keys are used by a human user (subscriber) to select programming content. Remote control 1430 comprises the identical key set that comprises keyboard 1410. Remote control 1430 emits infra-red modulated light that is detected by infra-red sensor 1420. The output of keyboard 1410 and infra-red sense circuit 1420 are directed to key-sense interface 1370 integral to reception unit 1250.

Hospital Reception Unit

Fig. 25 demonstrates a novel mounting configuration for reception unit 1250. This configuration comprises adjustable bed 1520 comprising console 1500 that is mounted on or proximate to bed-rail 1510. The electronic equipment comprising reception unit 1250 is mounted within console 1500.

Console 1500 serves as a base for display head 1540 that is suspended in an arbitrary position by flexible conduit gooseneck 1550. When a patient wants to watch entertainment content, flexible gooseneck 1550 is positioned to enable viewing of the display head while maximizing patient comfort.

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special functions directly that are not conducive to traversing a graphical menu sequence. These may include intercom, nurse-call functions or control of action games that the hospital patient may be playing. Display head 1540 also includes a small speaker 1730 and an ear-phone receptacle 1740 to enable the presentation of audio content to the hospital patient.

5

10 *Alternative Embodiments*

While this invention has been described in terms of several preferred embodiments, it is contemplated that alternatives, modifications, permutations, and equivalents thereof will become apparent to those skilled in the art upon a reading of the specification and study of the drawings. It is therefore intended that the true spirit and scope of the present include all such alternatives,

15 modifications, permutations, and equivalents.

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10. The method of Claim 8 wherein the computer readable media comprises an electronic mail message.
11. The method of Claim 1 further comprising the step of receiving a plurality of commercial content descriptors.
- 5 12. The method of Claim 2 further comprising the step of receiving a plurality of entertainment content descriptors.
13. The method of Claim 11 wherein the commercial content descriptors comprise a start date and an end date and the commercial content associated with a descriptor is disseminated to the plurality of subscribers substantially within the window of time defined by said start date
10 and said end date.
14. The method of Claim 11 wherein the commercial content descriptors comprise a start time and an end time and the commercial content associated with a descriptor is disseminated to the plurality of subscribers substantially within the window of time defined by said start time and said end time.
- 15 15. The method of Claim 11 wherein the commercial content descriptors comprise a presentation strategy indicator and the commercial content associated with a descriptor is disseminated to all subscribers in the facility or to only those subscribers whose demographic codes are commensurate with the demographic codes in said presentation strategy.
16. The method of Claim 11 wherein the commercial content descriptors comprise an
20 enumeration of presentation times and the commercial content associated with the descriptor will be disseminated to a plurality of subscribers substantially at the times enumerated.
17. The method of Claim 12 wherein the entertainment content descriptors comprise a start date and an end date.
18. The method of Claim 12 wherein the entertainment content descriptors comprise a spot
25 allowance indicator and an enumeration of spot insertion points.
19. A method of delivering dissimilar program content to a plurality of subscribers comprising the steps of:
establishing a logical conduit for each of a plurality of subscribers;
receiving program requests from each of a plurality of subscribers;

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creating a delivery script for each of a plurality of subscribers;

identifying all advertisements that:

require broadcast distribution;

have not yet expired; and

5 must be presented at predetermined times; and

assigning the identified advertisements to each of the delivery scripts for each of the plurality of subscribers.

28. The method of Claim 27 further comprising the steps of:

identifying all advertisements that:

10 require broadcast distribution;

have not yet expired; and

must be presented within a prescribed time slot; and

assigning the identified advertisements to each of the delivery scripts for each of the plurality of subscribers.

15 29. A method for delivering advertising content to a plurality of subscribers comprising the steps of:

creating a delivery script for each of a plurality of subscribers;

identifying all advertisements that:

require targeted distribution; and

20 have not yet expired; and

assigning the identified advertisements to each of the delivery scripts for each of the plurality of subscribers where a demographic code for the advertisements corresponds to a demographic code for each of the plurality of subscribers.

30. A method for disseminating program content to a plurality of subscribers comprising the steps of:

25 receiving advertising content into a cache;

receiving entertainment content from a broadcast source;

identifying insertion opportunities for advertising content in the entertainment content;

directing the entertainment content to a subscriber;

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interrupting the entertainment content during identified insertion opportunities;
retrieving an advertisement from the content cache;
directing the advertisement to a subscriber in accordance with a delivery script so long as
an advertising insertion opportunity persists; and
5 resuming the direction of entertainment content to the subscriber once the advertising
insertion opportunity desists.

31. The method of Claim 30 wherein the identification of insertion opportunities is accomplished
by monitoring the broadcast source for special signals or data codes.

32. The method of Claim 30 wherein the identification of insertion opportunities is accomplished
10 by declaring an insertion opportunity at predetermined intervals at predetermined times.

33. A method for disseminating program content to a plurality of subscribers comprising the steps
of:

receiving advertising content into a cache;
receiving entertainment content into a cache;
15 identifying insertion opportunities for advertising content in the entertainment content;
retrieving the entertainment content from the cache and directing it to a subscriber;
interrupting the entertainment content during identified insertion opportunities;
retrieving an advertisement from the content cache;
directing the advertisement to a subscriber in accordance with a delivery script so long as
20 an advertising insertion opportunity persists; and
resuming the direction of entertainment content to the subscriber once the advertising
insertion opportunity desists.

34. The method of Claim 33 wherein the identification of insertion opportunities is accomplished
by declaring an insertion opportunity at predetermined intervals at predetermined times.

25 35. A method for creating a plurality of virtual conduits from a source to a plurality of subscribers
comprising the steps of:

allocating a portion of the bandwidth of a medium;
segregating the allocated bandwidth into a plurality of channels;

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creating a plurality of time multiplexed data carriers each carrying a plurality of data streams; and

directing each of said time multiplexed data carriers through one of said plurality of channels.

5 36. The method of Claim 35 further comprising the steps of:

assigning a channel and a stream to each of said subscribers; and

directing each of said plurality of subscribers to select a channel and stream according to said assignment.

37. The method of Claim 35 wherein the time multiplexed data carrier is a modulated signal

10 having amplitude varying according to the data.

38. The method of Claim 35 wherein the time multiplexed data carrier is a modulated signal

having phase varying according to the data.

39. The method of Claim 35 wherein the time multiplexed data carrier is a modulated signal

having amplitude and phase varying according to the data.

15 40. A method for creating a time multiplexed data carrier comprising the steps of:

receiving sequential frames of digitized content from a plurality of broadcast sources;

directing every other sequential frame from each broadcast source to one of two

alternating buffers where there is a set of alternating buffers for each broadcast source;

retrieving a plurality of frames from one of the alternating buffers for each of a plurality of

20 broadcast sources in a successive manner where the frames are received from the buffers

opposing the buffer then receiving a sequential frame from a broadcast source; and

concatenating the successively retrieved plurality of frames to form a plurality of time multiplexed data streams.

41. The method of Claim 40 wherein the plurality of frames retrieved from alternating buffers are

25 selected in accordance with a program request received from a subscriber.

42. A method for injecting commercial content into a data stream included in a time multiplexed data carrier comprising the steps of:

receiving commercial content into a cache where the commercial content is stored as a plurality of frame sequences;

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receiving sequential frames of digitized content from a plurality of broadcast sources;

directing every other sequential frame from each broadcast source to one of two alternating buffers where there is a set of alternating buffers for each broadcast source;

identifying insertion opportunities for the commercial content;

retrieving a plurality of broadcast frames from one of the alternating buffers for each of a plurality of broadcast sources in a successive manner where the frames are received from the buffers opposing the buffers then receiving a sequential frame from a broadcast source so long as there is not an opportunity to insert commercial content;

retrieving from a cache a sequence of frames representing commercial content so long as there is an opportunity to insert commercial content;

concatenating the successively retrieved plurality of broadcast frames and

sequence of commercial content frames to form a plurality of time multiplexed data streams.

41. The method of Claim 42 wherein the plurality of frames retrieved from alternating buffers are selected in accordance with a program request received from a subscriber.

42. The method of Claim 42 wherein the frame sequence representing commercial content retrieved from the cache is selected in accordance with a delivery script.

43. The method of Claim 42 wherein the commercial content is received from computer readable media.

44. The method of Claim 42 wherein the amount of commercial content received is that required for an upcoming period of time.

45. The method of Claim 42 wherein the cache comprises random access memory.

46. An apparatus for delivering dissimilar program content to a plurality of subscribers comprising:

plurality of facilities each of which comprises:

broadcast entertainment receiver;

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commercial content receiver;

targeted delivery server that:

receives broadcast entertainment from said broadcast entertainment receiver;

5 receives commercial content from said commercial content receiver;
delivers broadcast entertainment to a distribution system; and
delivers commercial content to a distribution system; and

distribution system that carries broadcast content.

47. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim
- 10 46 further comprising an entertainment content receiver and wherein the targeted deliver server further comprises the functions of: receiving entertainment content from the entertainment content receiver and delivers the entertainment content to a distribution system.
48. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 46 wherein the broadcast entertainment receiver is a satellite receiver.
- 15 49. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 46 wherein the broadcast entertainment receiver is an RF cable receiver.
50. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 46 further comprising a distribution center.
51. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim
- 20 47 further comprising a distribution center.
52. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 46 wherein the commercial content receiver further comprises a means to read computer readable media.
53. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim
- 25 47 wherein the entertainment content receiver further comprises a means to read computer readable media.
54. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 52 wherein the means to read computer readable media comprises a computer network interface.

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69. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 68 further comprising an advertisement content manager that assigns broadcast advertising spots to each of a plurality of subscribers delivers insertion lists for each of the plurality of subscribers to the target distribution server and wherein the target distribution server injects the broadcast advertising spots into each of the plurality of contest streams where the entertainment content is received from a broadcast source.

70. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 68 further comprising an advertisement content manager that assigns directed advertising spots to each of a plurality of subscribers according to a plurality of demographic codes corresponding to both the directed advertising spots and each of the plurality of subscribers and delivers insertion lists for each of the plurality of subscribers to the target distribution server and wherein the target distribution server injects the directed advertising spots into each of the plurality of contest streams where the entertainment content is received from a broadcast source.

71. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 68 further comprising an advertisement content manager that assigns directed advertising spots to each of a plurality of subscribers according to a plurality of demographic codes corresponding to both the directed advertising spots and each of the plurality of subscribers and delivers insertion lists for each of the plurality of subscribers to the target distribution server and wherein the target distribution server injects the directed advertising spots into each of the plurality of contest streams where the entertainment content is received from an on-demand cache.

72. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 70 wherein the advertisement content manager receives demographic codes for said plurality of subscribers by means of computer readable media.

73. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 72 wherein the computer readable media is an electronic mail message.

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74. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 71 wherein the advertisement content manager receives demographic codes for said plurality of subscribers by means of computer readable media.

75. The apparatus for delivering dissimilar program content to a plurality of subscribers of Claim 74 wherein the computer readable media is an electronic mail message.

76. An advertising content manager comprising:

database of commercial content descriptors;

a plurality of delivery scripts that define the time at which advertisements must be presented to a plurality of subscribers;

identification module that examines the commercial content descriptors in said database and flags those commercial content descriptors that:

require broadcast distribution;

have not expired; and

must be presented at predetermined times; and

assignment module that:

retrieves copies of the commercial content descriptors that have been flagged from said database; and

inserts said copies of the commercial content descriptors into each of said plurality of delivery scripts according at the predetermined time designated in the commercial content descriptor.

77. The advertising content manager of Claim 76 wherein:

the identification module further flags as secondary those commercial content descriptors that:

require broadcast distribution;

have not expired; and

must be presented within a prescribed time slot; and

the assignment module further:

retrieves copies of the commercial content descriptors that have been flagged as secondary from said database; and

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inserts said copies of the secondarily flagged commercial content descriptors into each of said plurality of delivery scripts according to the time slot designated in the commercial content descriptor.

78. An advertising content manager comprising:

- 5 database of commercial content descriptors;
- a plurality of delivery scripts that define the time at which advertisements must be presented to a plurality of subscribers;
- identification module that examines the commercial content descriptors in said database and flags those commercial content descriptors that:
- 10 require targeted distribution; and
- have not expired; and
- assignment module that:
- retrieves copies of the commercial content descriptors that have been flagged from said database; and
- 15 inserts said copies of the commercial content descriptors into the delivery scripts for each of a plurality of subscribers where a demographic code for the advertisement corresponds to a demographic code for each of the plurality of subscribers.

79. A targeted media server comprising:

- 20 cache for receiving advertising content;
- broadcast entertainment receiver;
- insertion indicator that determines when insertion of advertising content is permissible and asserts an insert signal when it is permissible to insert advertising content; and
- stream multiplexer that selects one of a plurality of content streams from either the
- 25 broadcast entertainment receiver or the cache for receiving advertising content and that selects a content stream emanating from the broadcast entertainment receiver when the insert signal is not asserted and selects a content stream from the cache for advertising content when it is asserted.

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80. The targeted media server of Claim 79 further comprising a virtual conduit unit that creates a virtual conduit to a subscriber for carrying the content stream selected by the stream multiplexer.

81. The targeted media server of Claim 79 wherein the insertion indicator monitors the broadcast source for special signals or data codes that indicative of insertion opportunities.

82. The targeted media server of Claim 79 wherein the insertion indicator declares an insertion opportunity at predetermined intervals and/or at predetermined times.

83. A targeted media server comprising:

cache for receiving advertising content;

cache for receiving entertainment content;

insertion indicator that determines when insertion of advertising content is permissible and asserts an insert signal when it is permissible to insert advertising content; and

stream multiplexer that selects one of a plurality of content streams from either the cache for receiving entertainment or the cache for receiving advertising content and that selects

a content stream emanating from the cache for entertainment content when the insert signal is not asserted and selects a content stream from the cache for advertising content when it is asserted.

84. The targeted media server of Claim 83 further comprising a virtual conduit unit that creates a virtual conduit to a subscriber for carrying the content stream selected by the stream multiplexer.

85. The targeted media server of Claim 83 wherein the insertion indicator declares an insertion opportunity at predetermined intervals and/or at predetermined times.

86. A virtual conduit unit comprising:

A plurality of multiplexer for receiving a plurality of data streams;

controller that directs the plurality of multiplexers to select one of said plurality of data streams on a continuous and cyclical basis;

a plurality of carrier modulators that are respectively modulated by the output of the plurality of multiplexers and emanate modulated carriers; and

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an alternating set of buffer that receive alternating frames of digitized content;
ping-pong register that enables the alternating buffer not receiving digitized frames
to propagate the digitized content stored therein as the output of the broadcast
reception unit; and

5 multiplexer that selects the output of a plurality of broadcast reception units and retrieves
data from the commercial content cache in a continuous manner.

94. The stream multiplexer of Claim 93 further comprising a program selection unit that receives
program request from a plurality of subscribers and directs the multiplexer to select the
output of a broadcast reception unit in accordance with the received program request and
10 directs the multiplexer to retrieve commercial content in accordance with a delivery script.

95. The stream multiplexer of Claim 93 wherein the commercial cache is loaded from computer
readable media.

96. The stream multiplexer of Claim 93 wherein the commercial cache is loaded with an amount
of content so as to satisfy an upcoming period of time.

15 97. The stream multiplexer of Claim 93 wherein the commercial cache comprises random access
memory.

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**SYSTEM, METHOD, AND ARTICLE OF MANUFACTURE FOR DELIVERING
DISSIMILAR ENTERTAINMENT AND ADVERTISING CONTENT TO A
PLURALITY OF SUBSCRIBERS**

ABSTRACT

A method and article of manufacture are provided for facilitating the delivery of dissimilar content to a plurality of subscribers. Entertainment content can be delivered to the subscribers on-demand and commercial advertisements can be directed to specific subscribers based on a priori demographic knowledge. The subscriber pool is segregated into smaller sets called facilities. Dissimilar content is delivered to a plurality of facilities by computer networks and satellite feeds from a distribution center. The dissimilar content in each of the plurality of facilities is managed by a pointcast server that interleaves compressed digital content from broadcast, on-demand entertainment and commercial advertisement stored in a high-speed access cache. The interleaving of content is specified by a presentation script developed by the distribution center and disseminated to the plurality of facilities.

J'maev, Jack 45,669
Dckt: JJ-001US
Expr ET617840249US

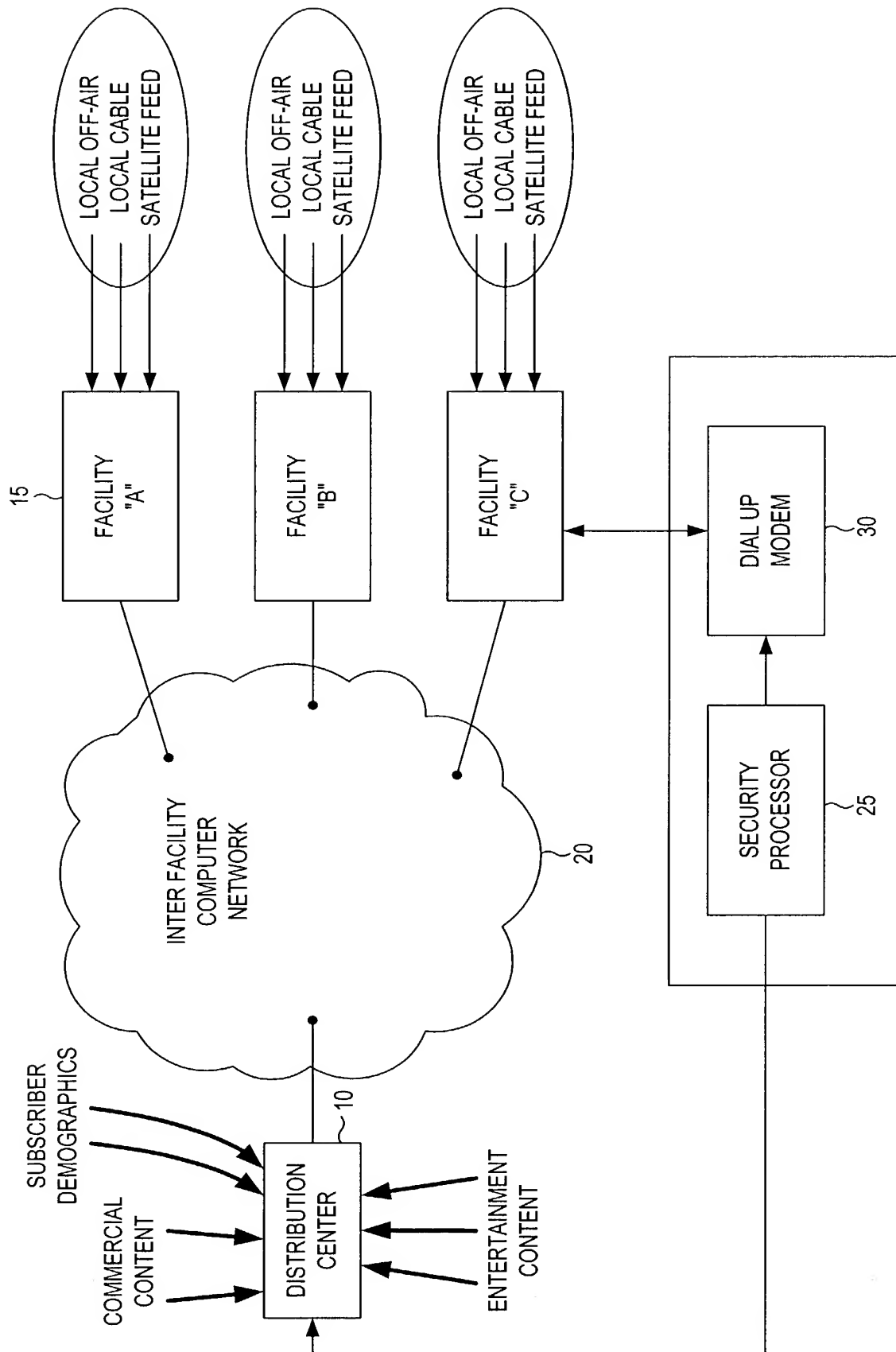


FIG. 1

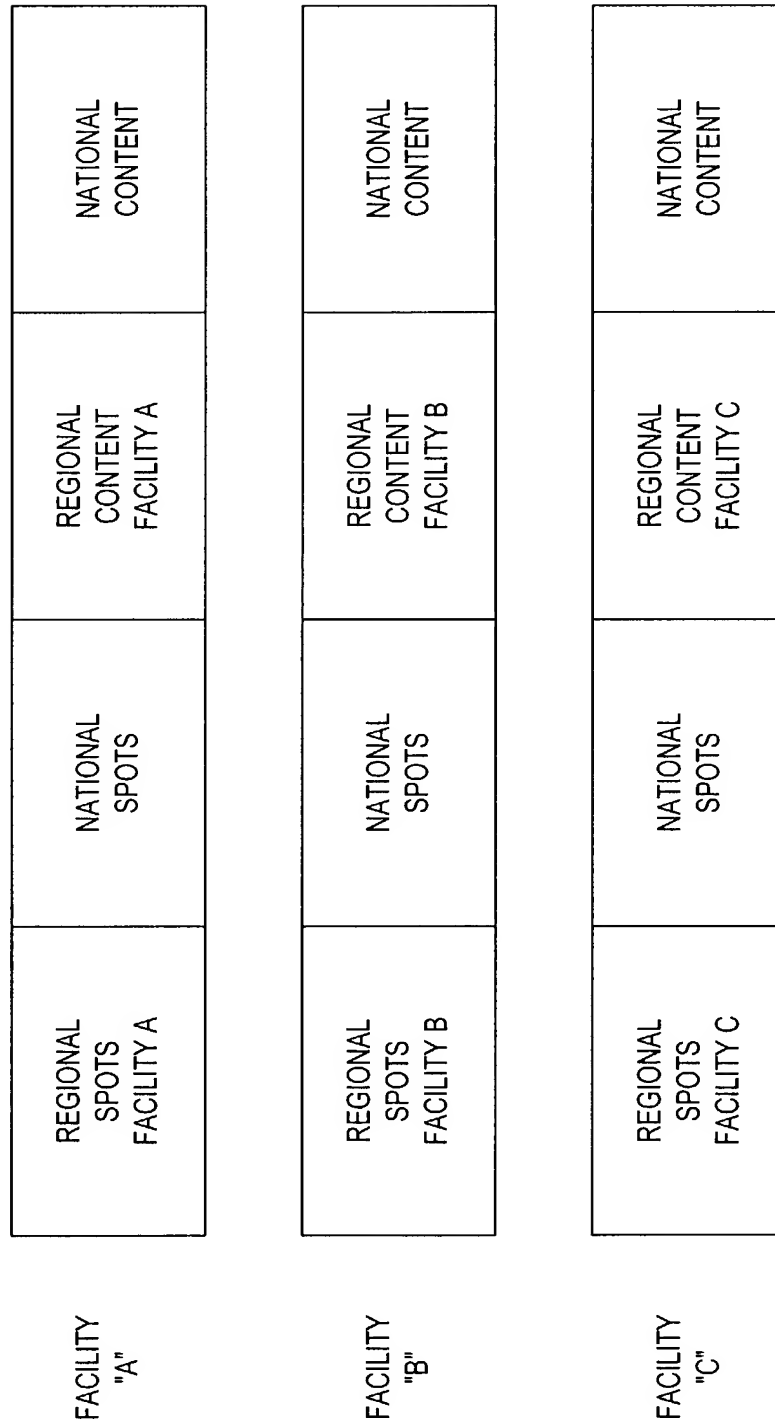


FIG. 2

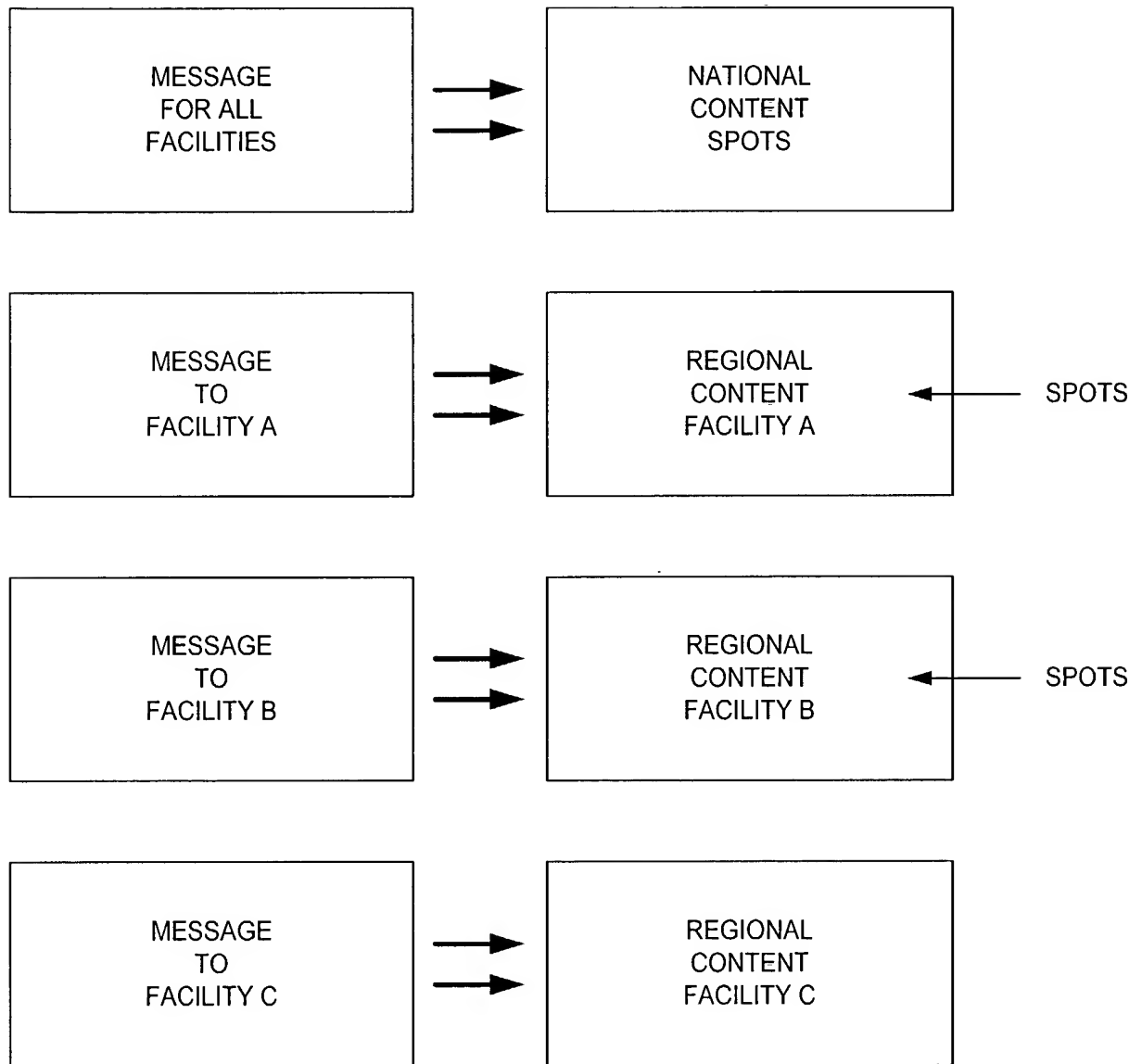


FIG. 3





ENTERTAINMENT CONTENT DESCRIPTOR

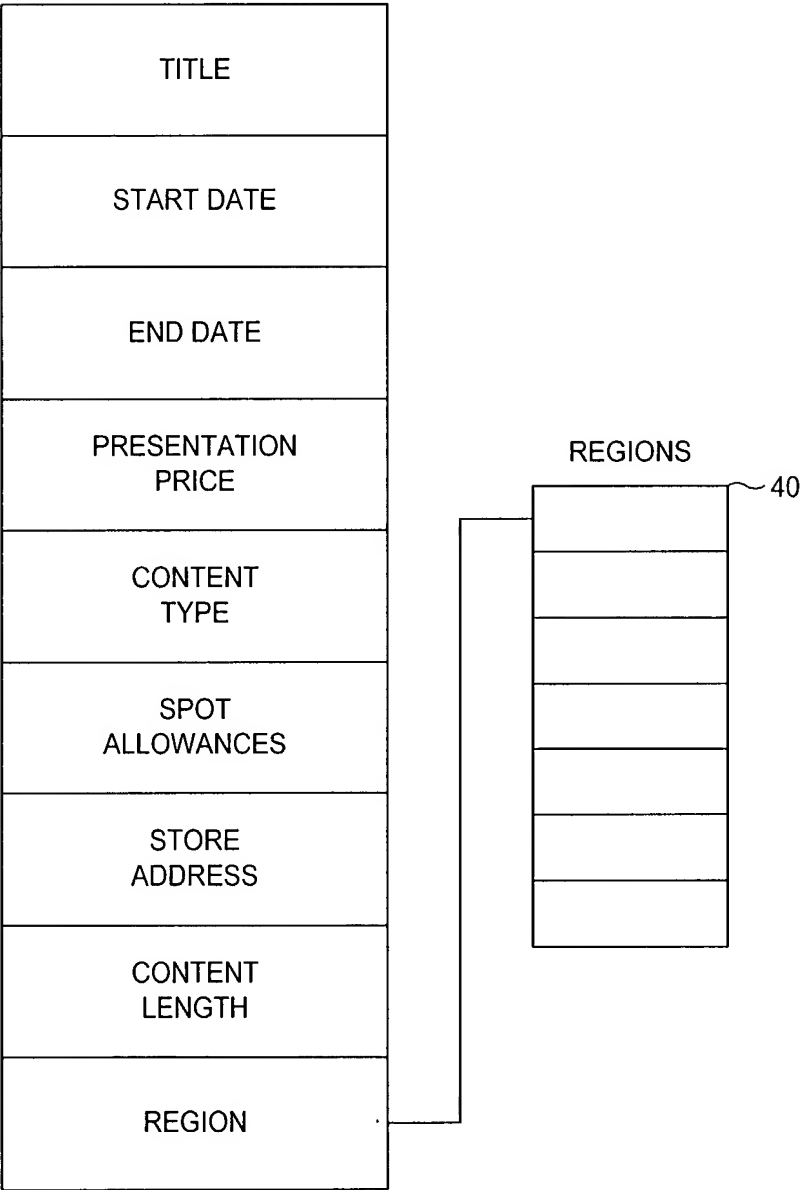


FIG. 4



COMMERCIAL CONTENT DESCRIPTOR

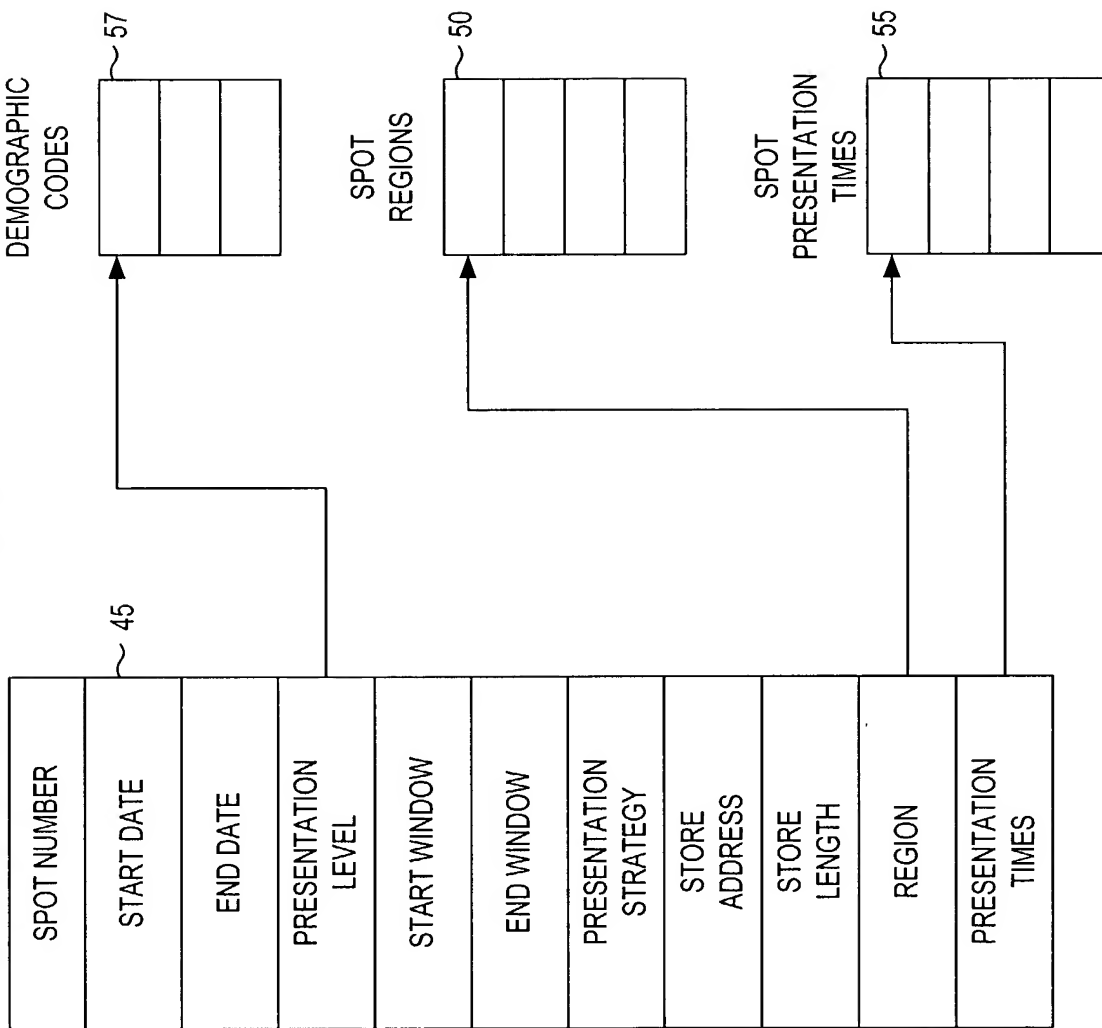


FIG. 5

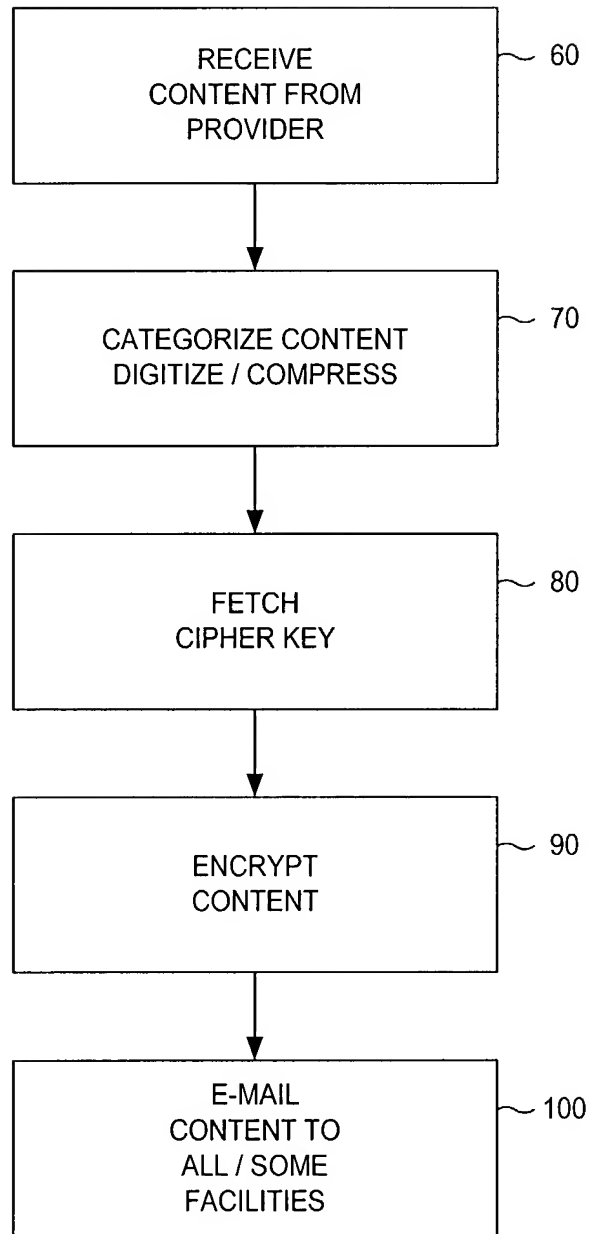


FIG. 6

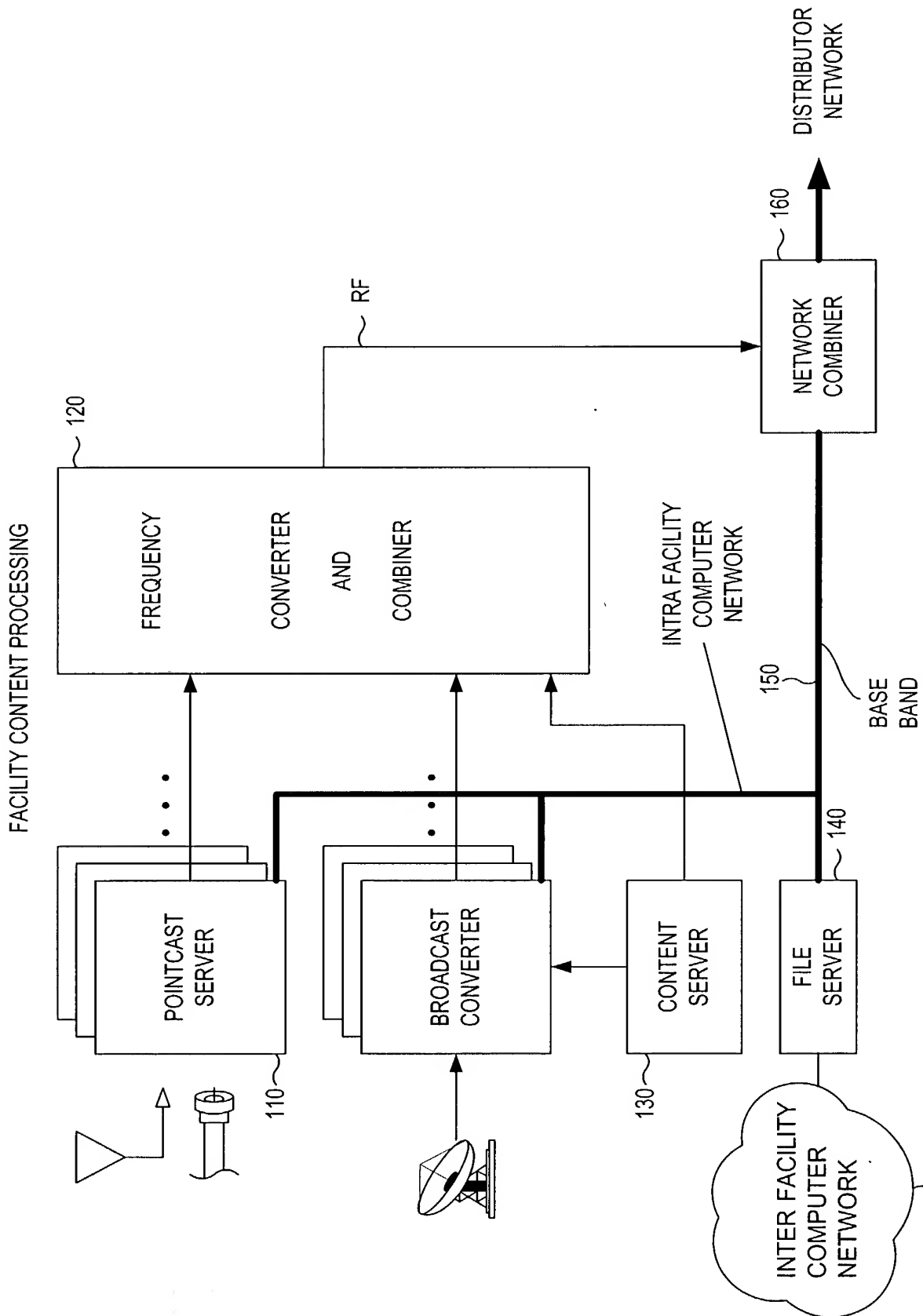
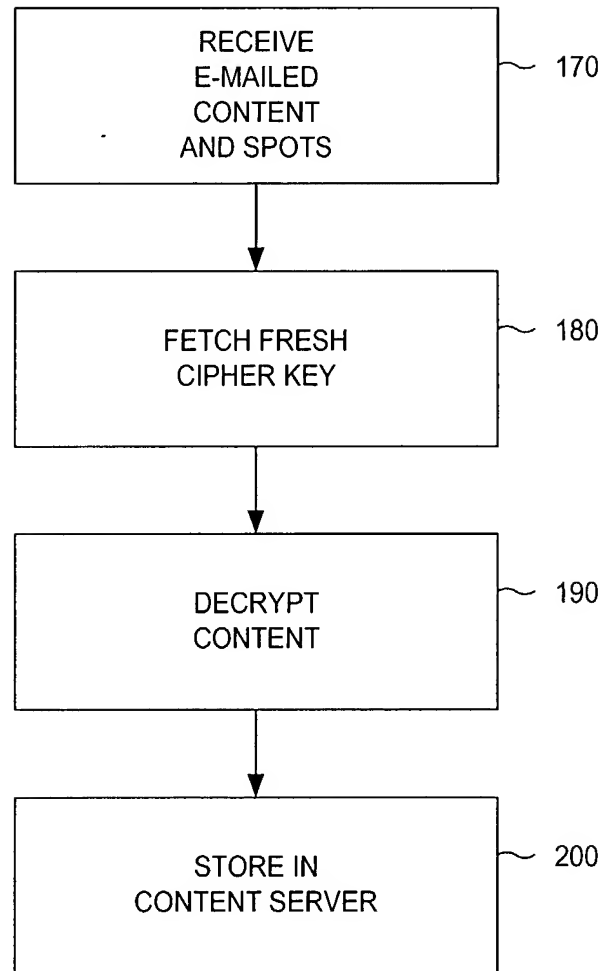


FIG. 7

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**FIG. 8**

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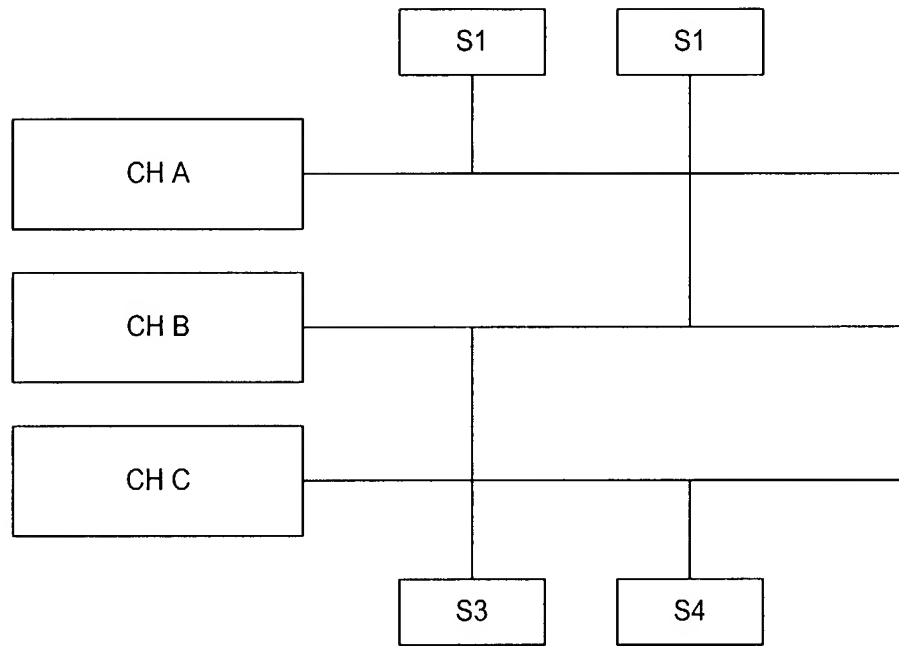


FIG. 8A

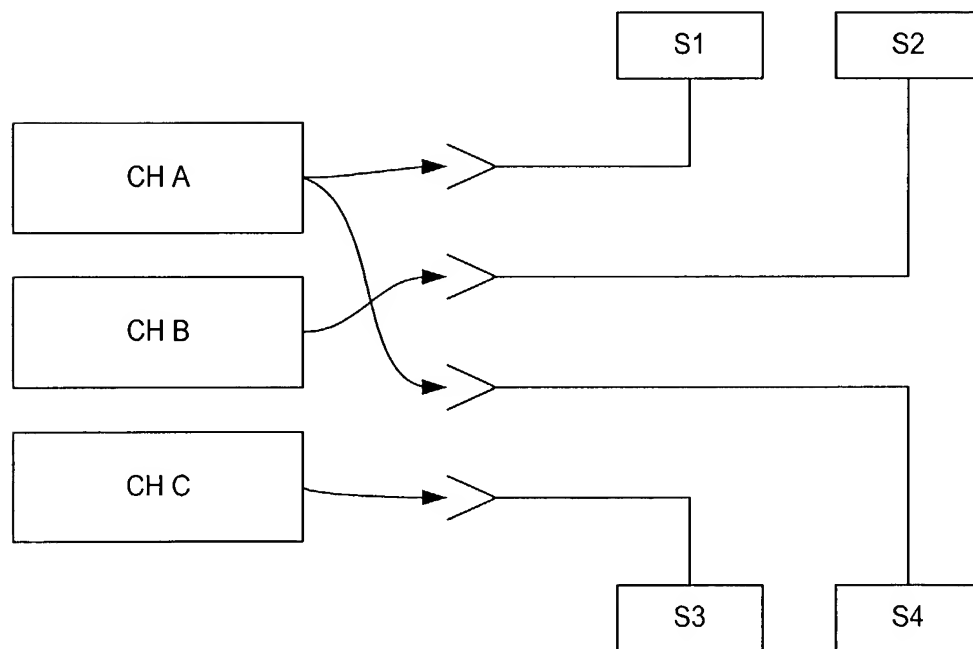


FIG. 8B



SUBSCRIBER	DEMOGRAPHIC CODES				280

FIG. 9A

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BROADCAST DELIVERY SCRIPT

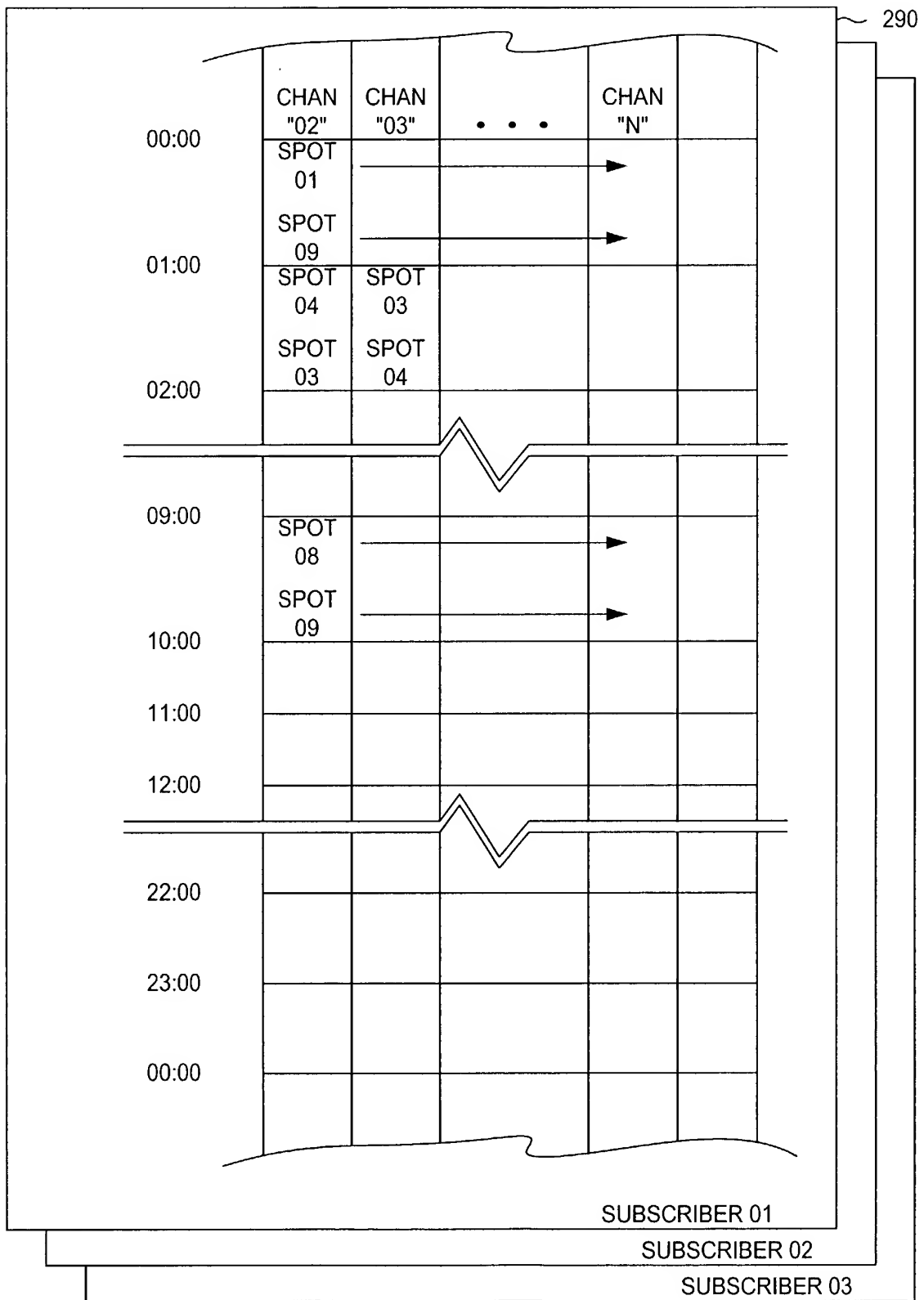


FIG. 10

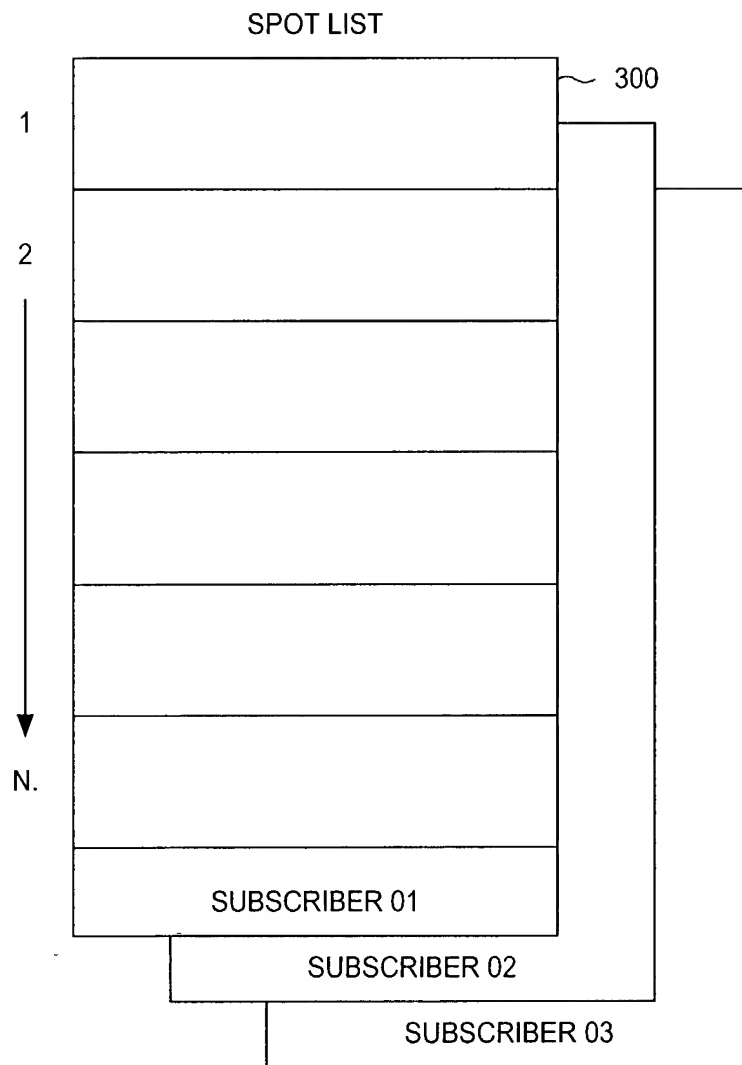


FIG. 11



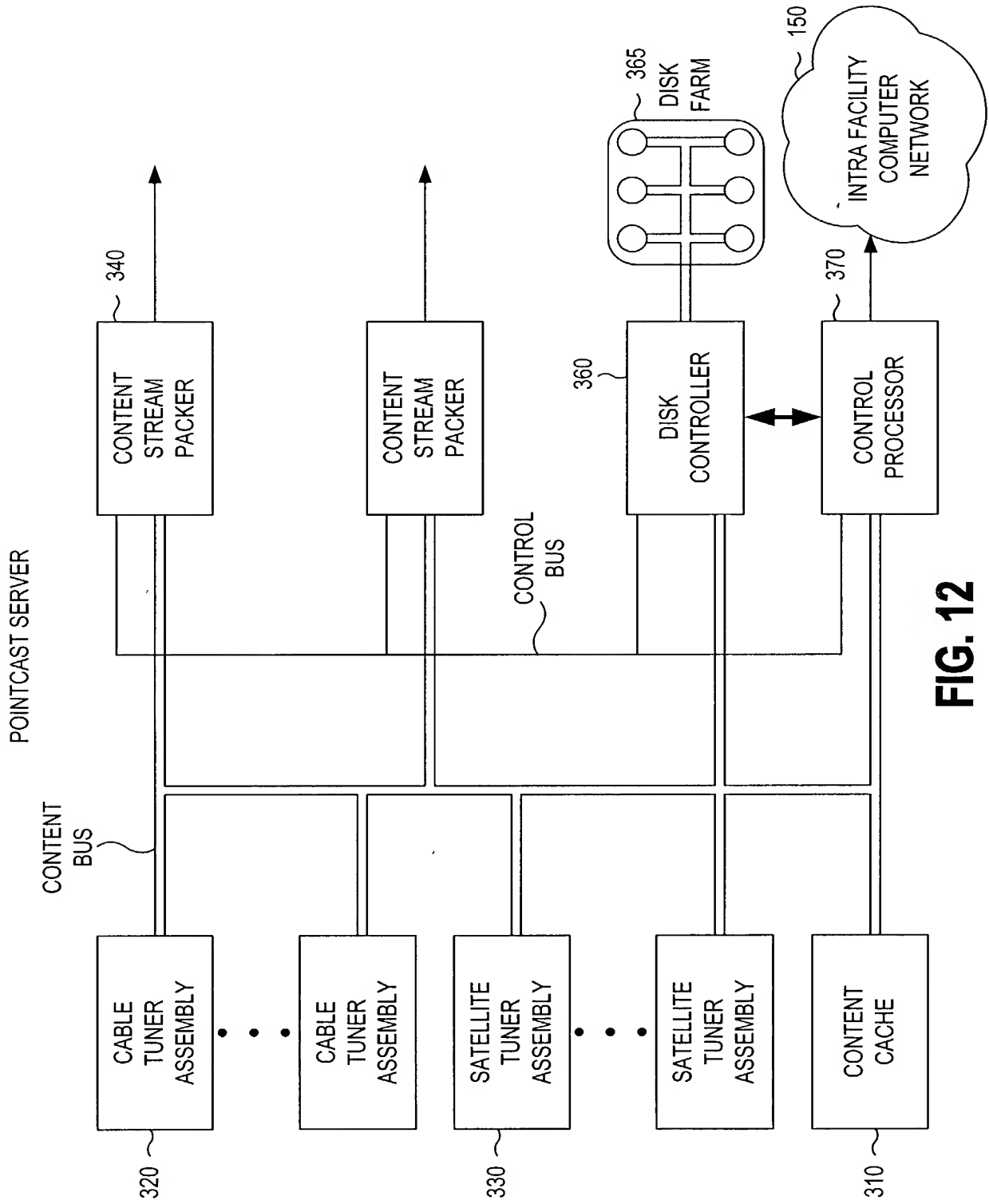
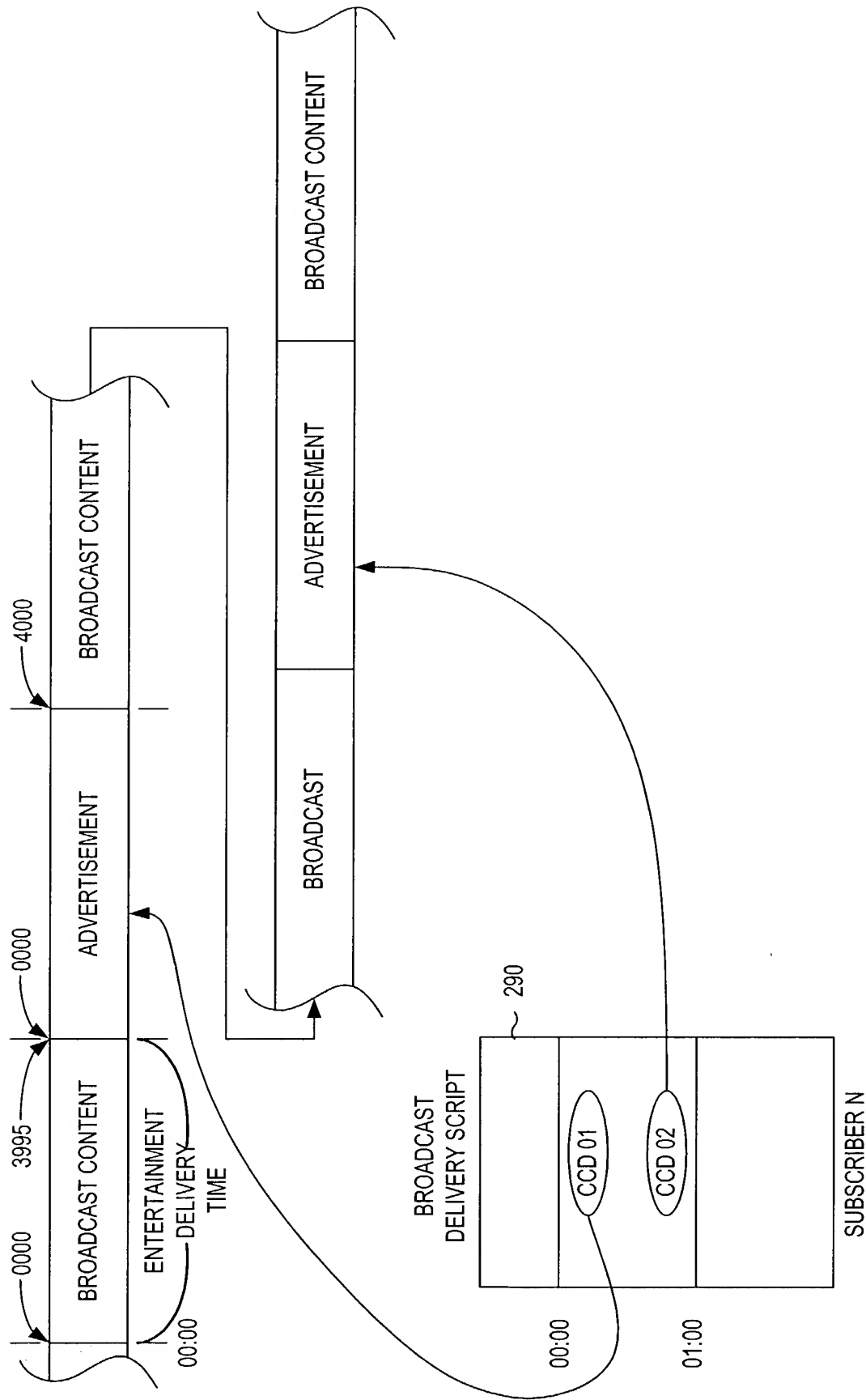


FIG. 12

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CONTENT STREAM, SUBSCRIBER N



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FIG. 12A

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TUNER ASSEMBLY

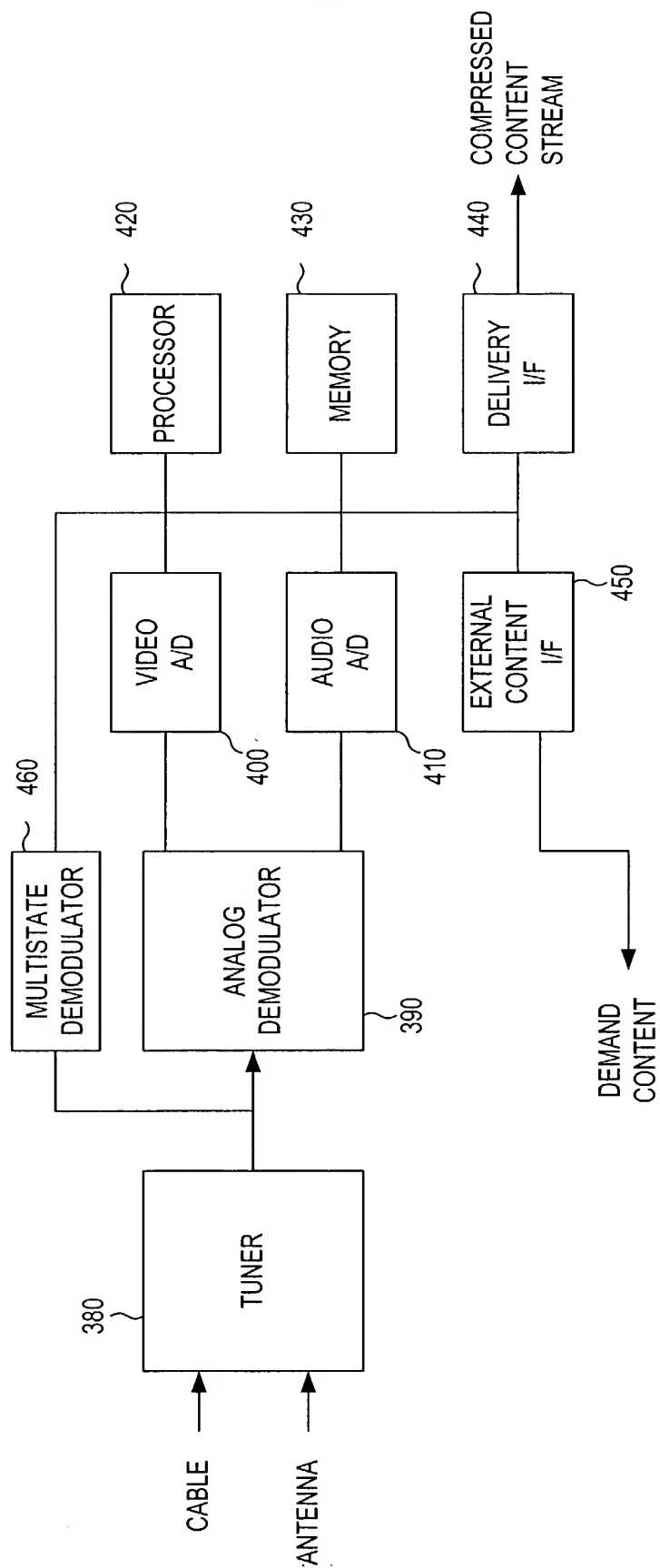


FIG. 13

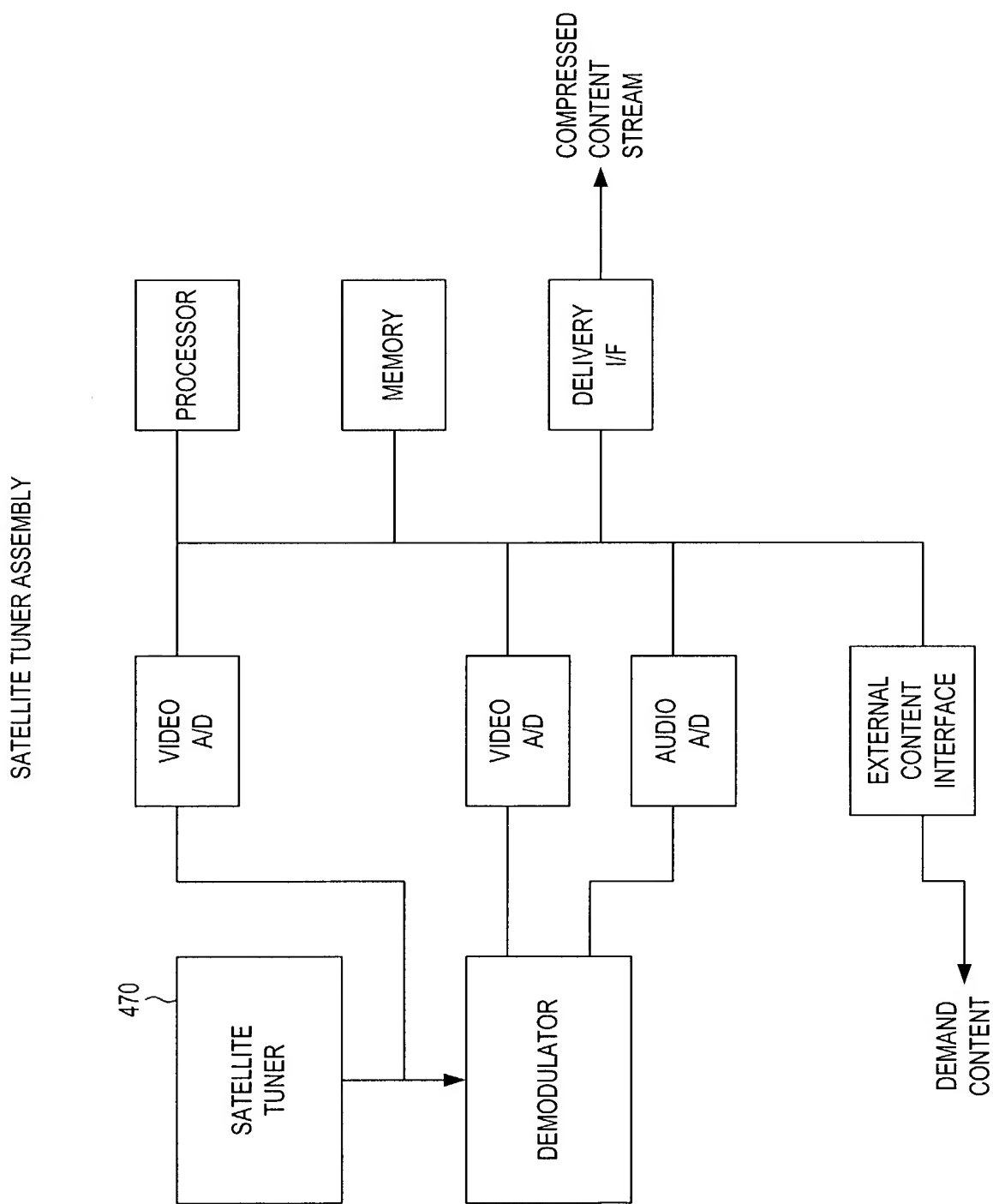


FIG. 14

CONTENT STREAM PACKER

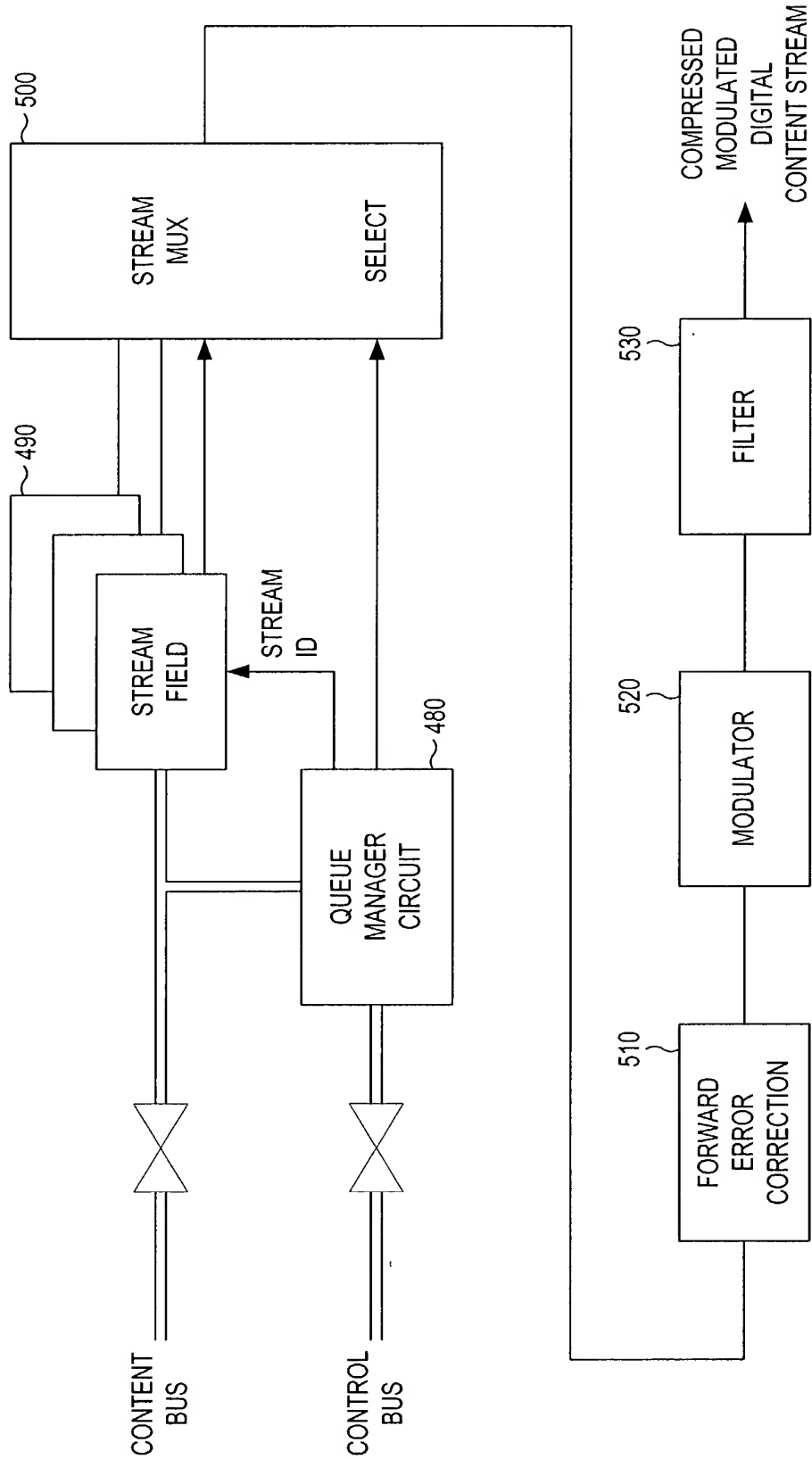


FIG. 15

+

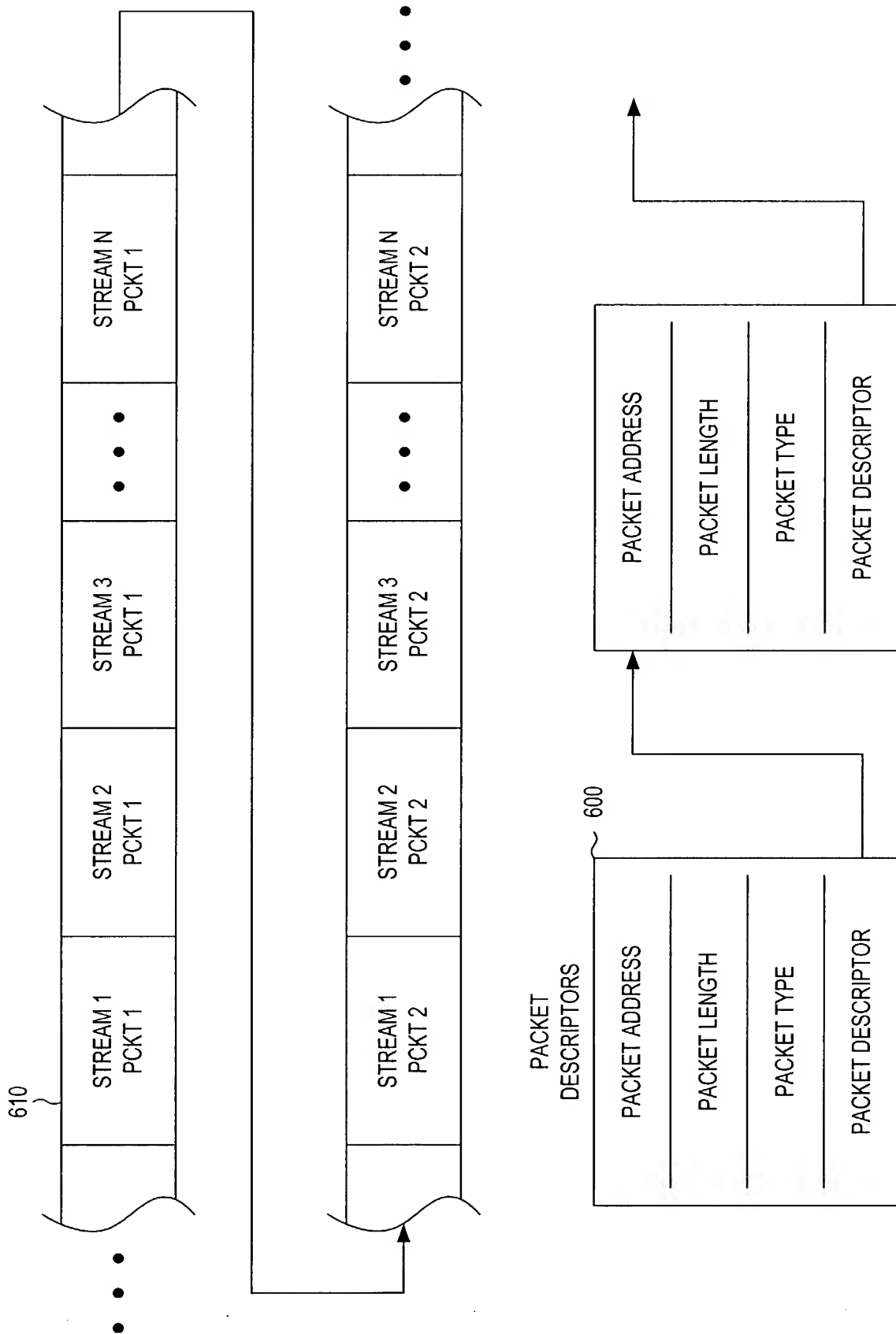


FIG. 17

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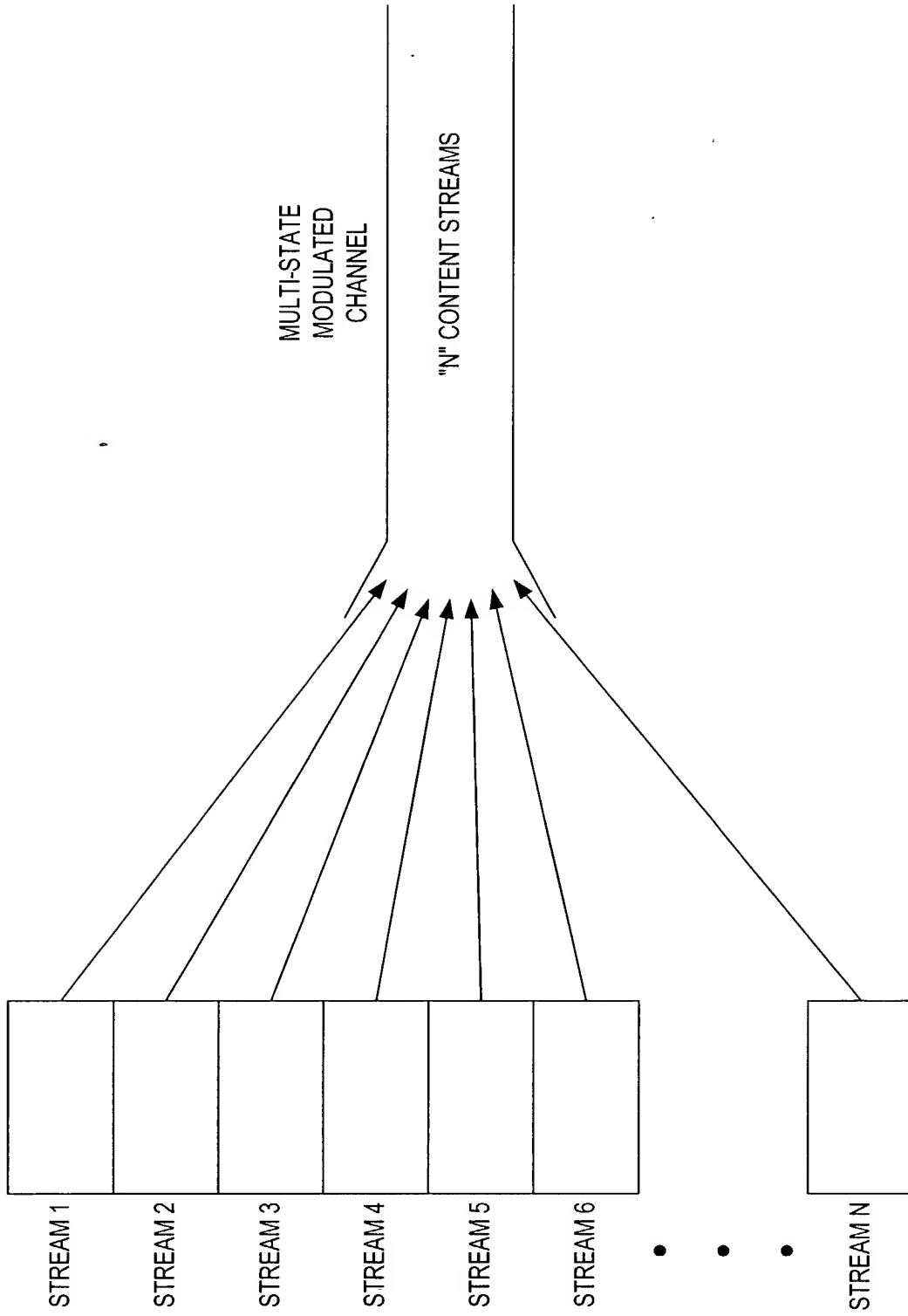


FIG. 17A

FREQUENCY CONVERTER / COMBINER

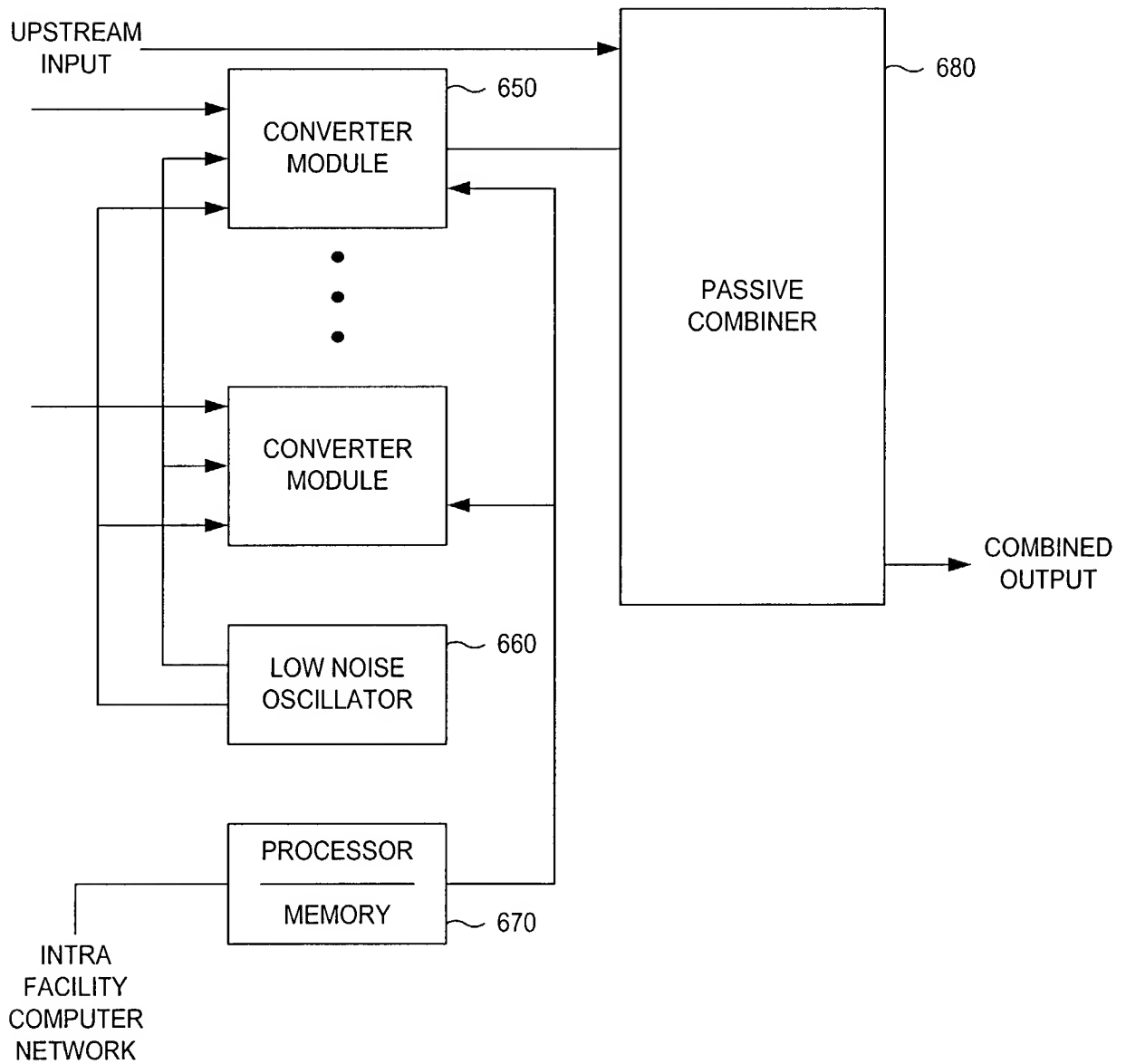


FIG. 18

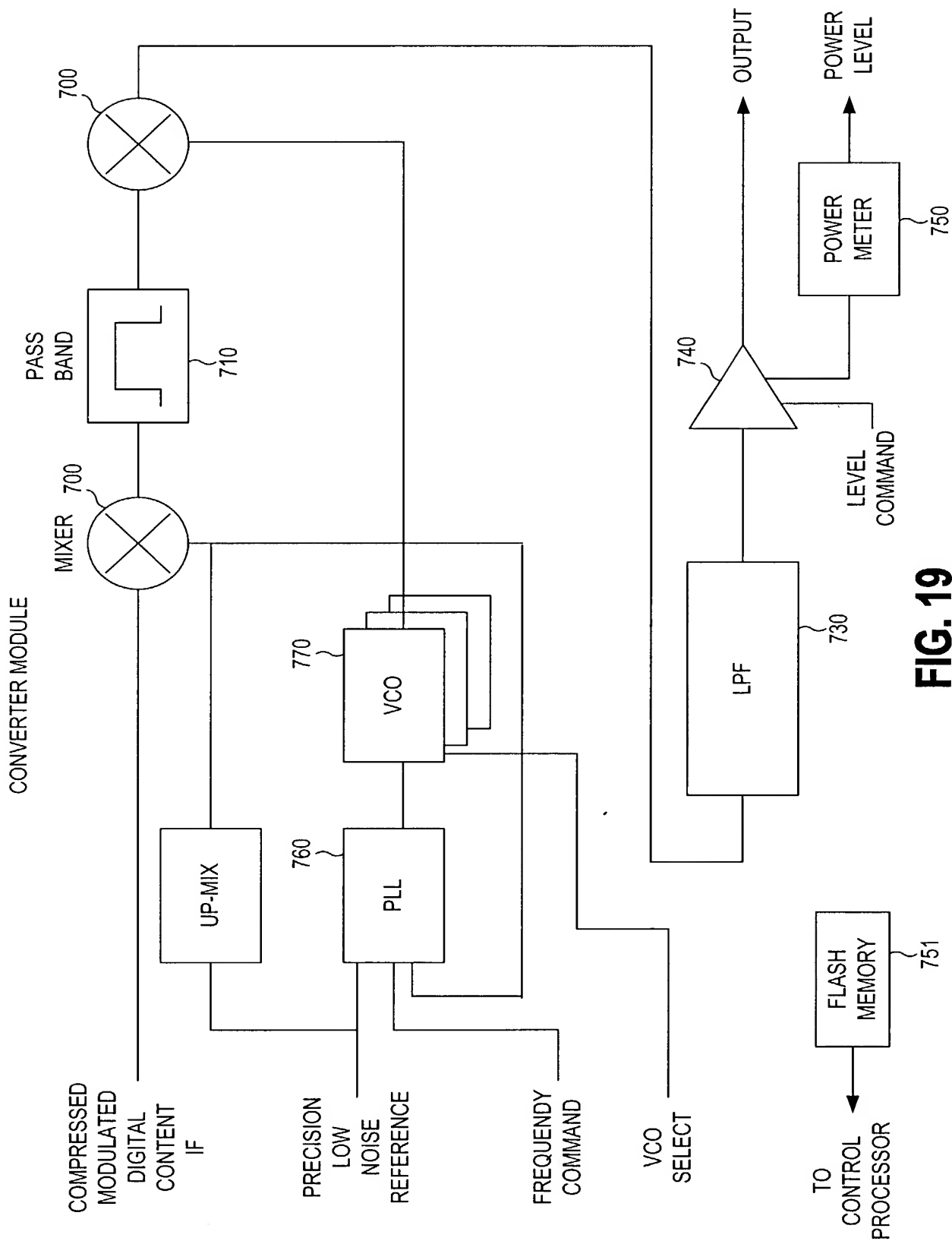


FIG. 19

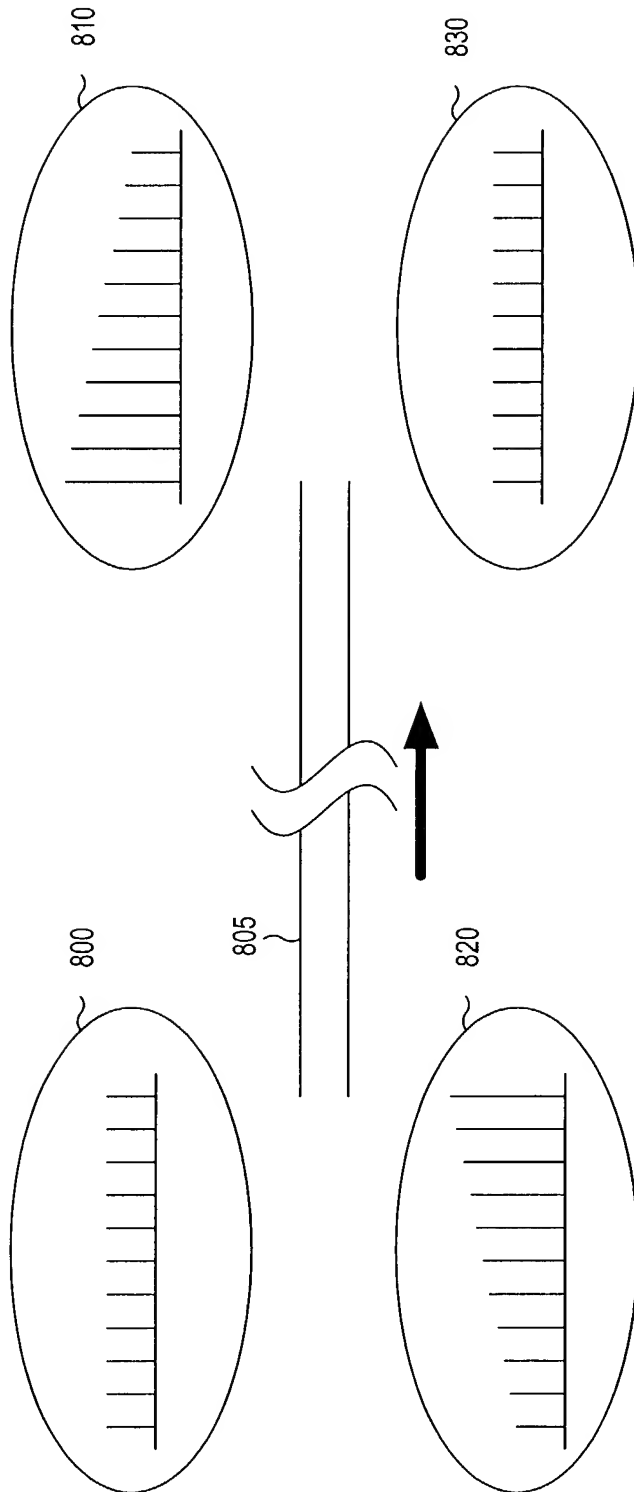


FIG. 19A



TRADITIONAL FACILITY DISTRIBUTION
(PRIOR ART)

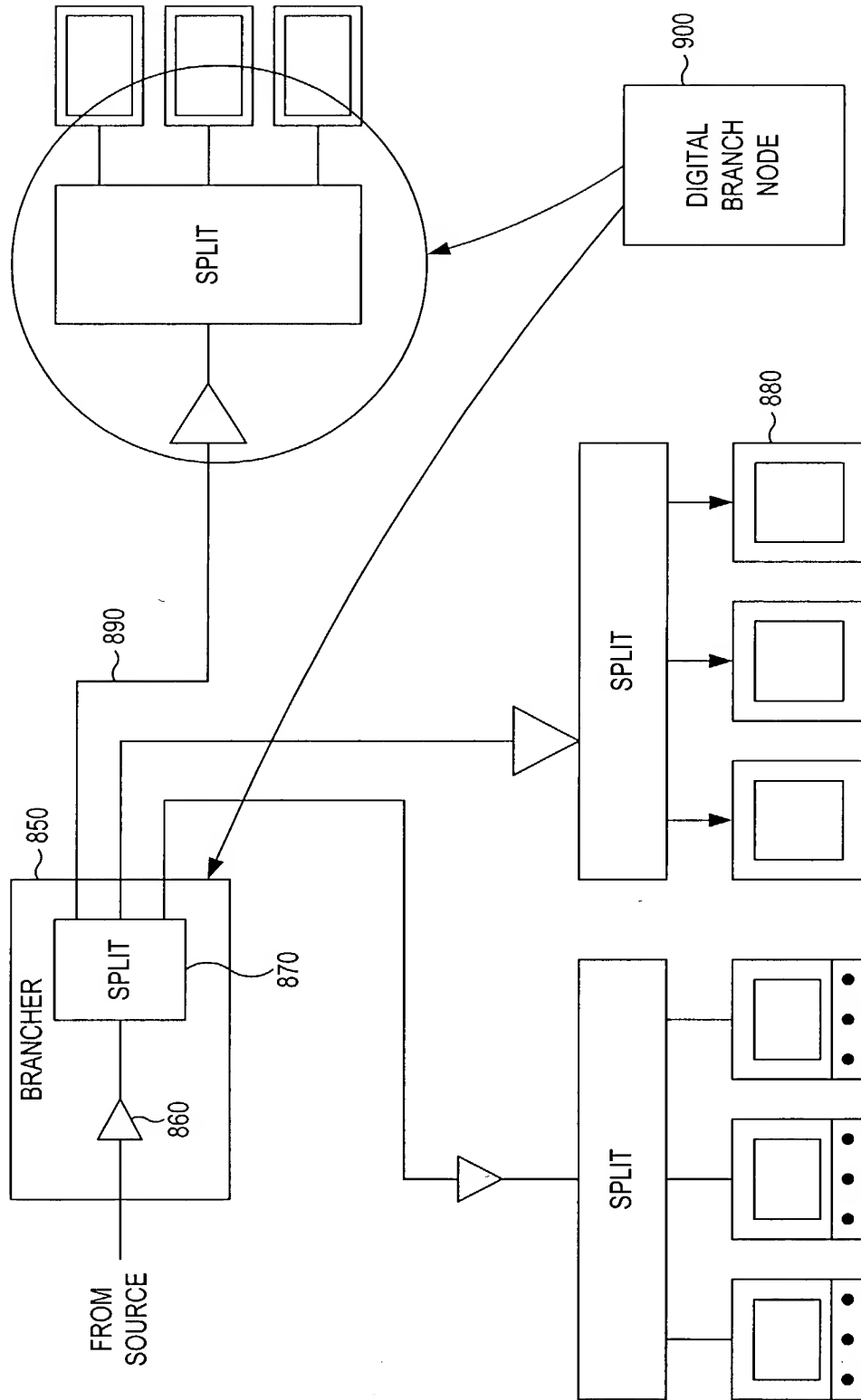


FIG. 20

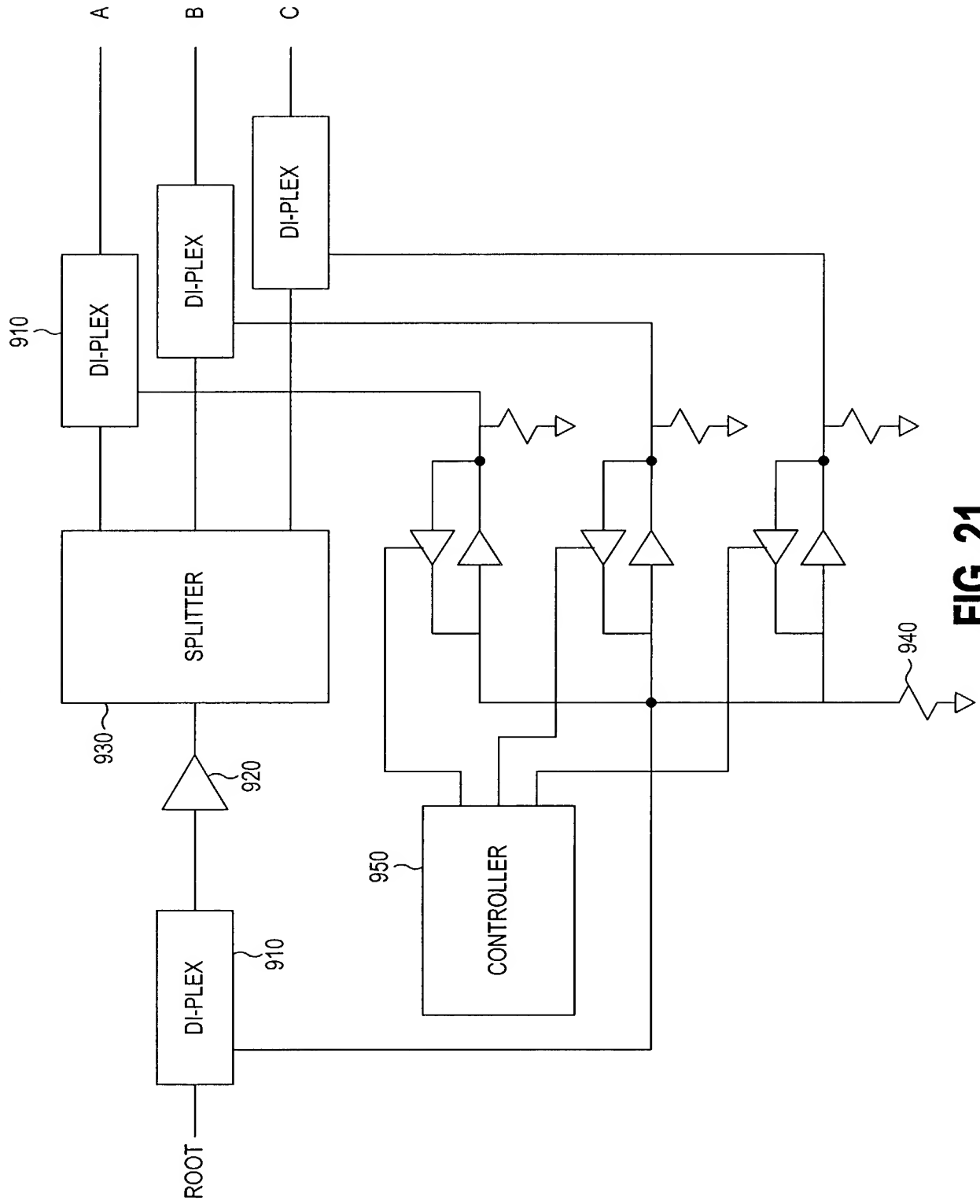


FIG. 21

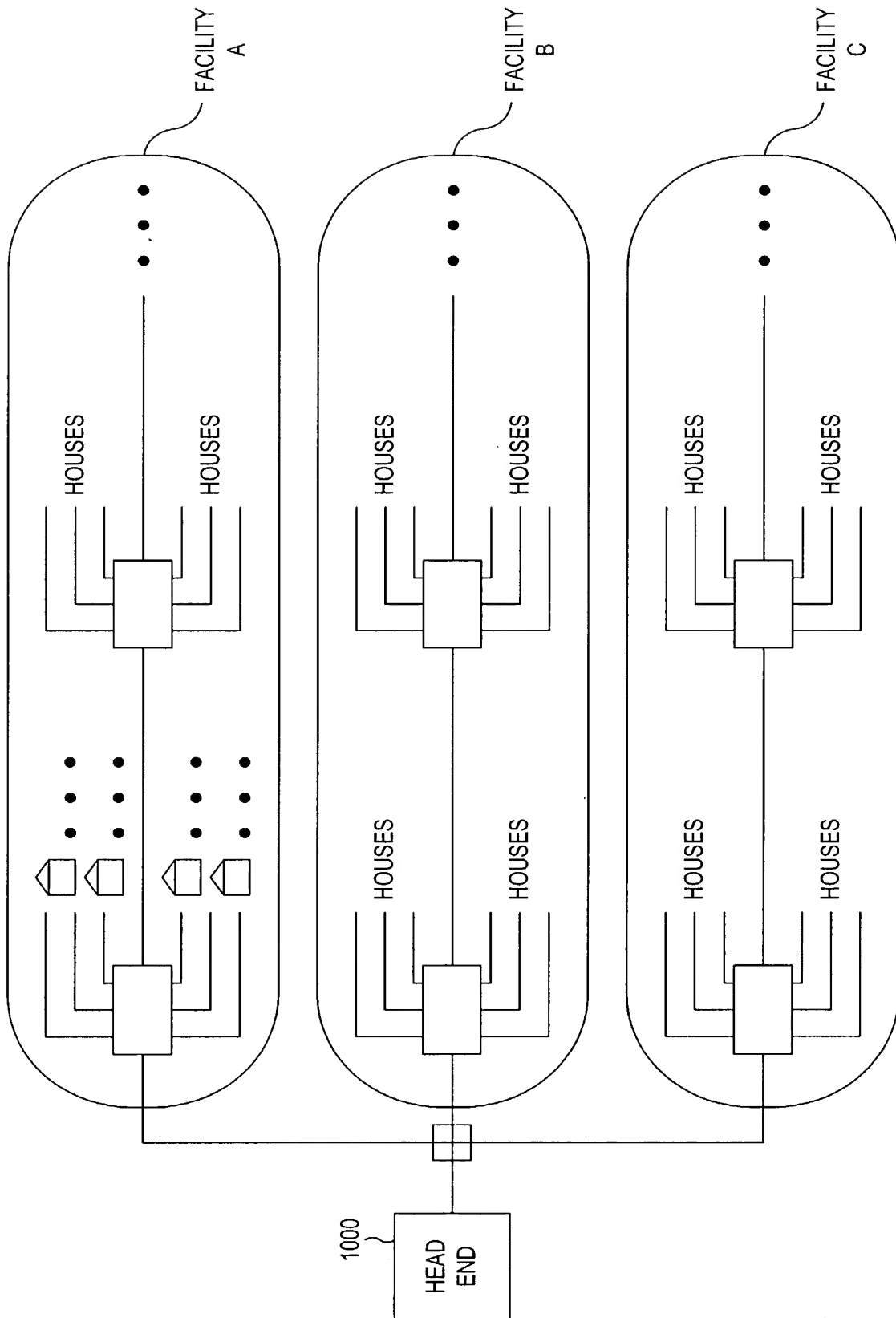


FIG. 22

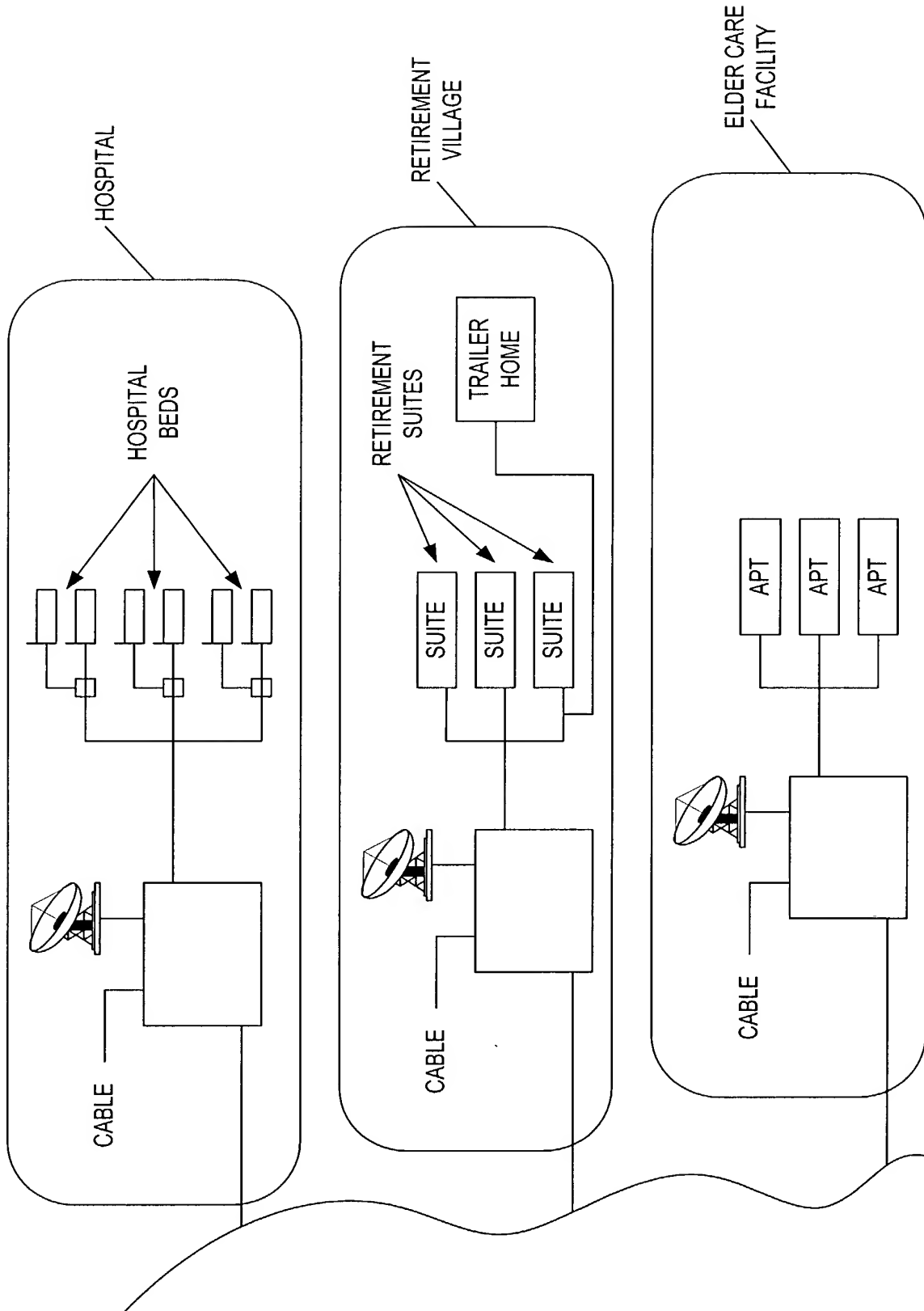


FIG. 23

+

SUBSCRIBER	NETWORK ADDRESS	CHANNEL	STREAM
01	00:00:00	1	1
02	~	1	2
03	~	1	3
•			
•			
•			
10	~	2	1
11	~	2	2
•			
•			
•			
N			

~ 1200

+

FIG. 24

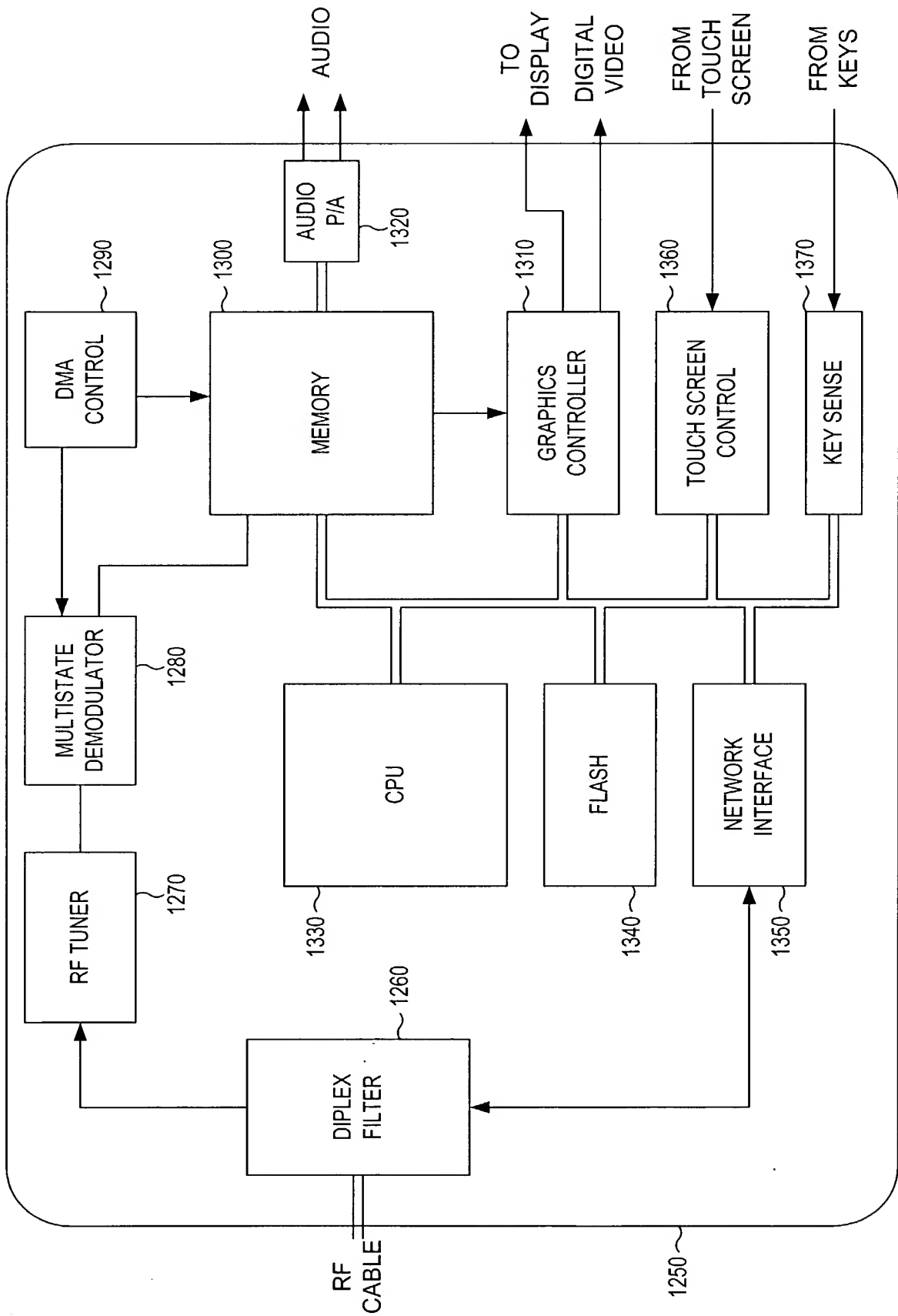


FIG. 24A

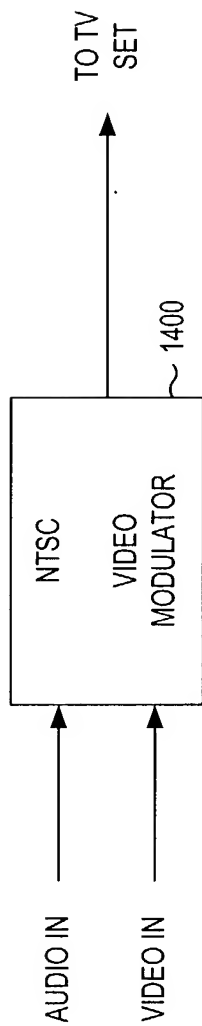


FIG. 24B

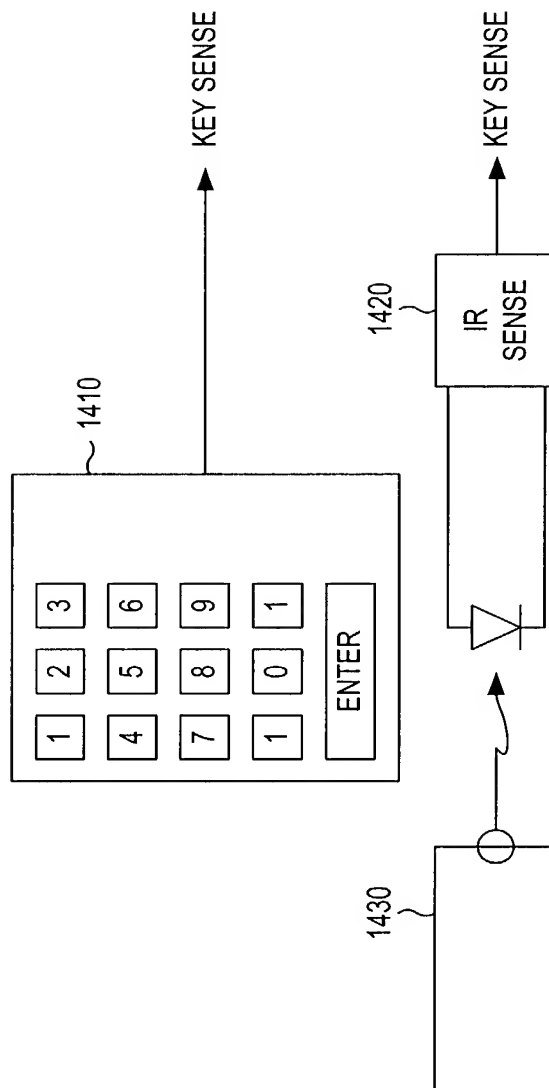


FIG. 24C

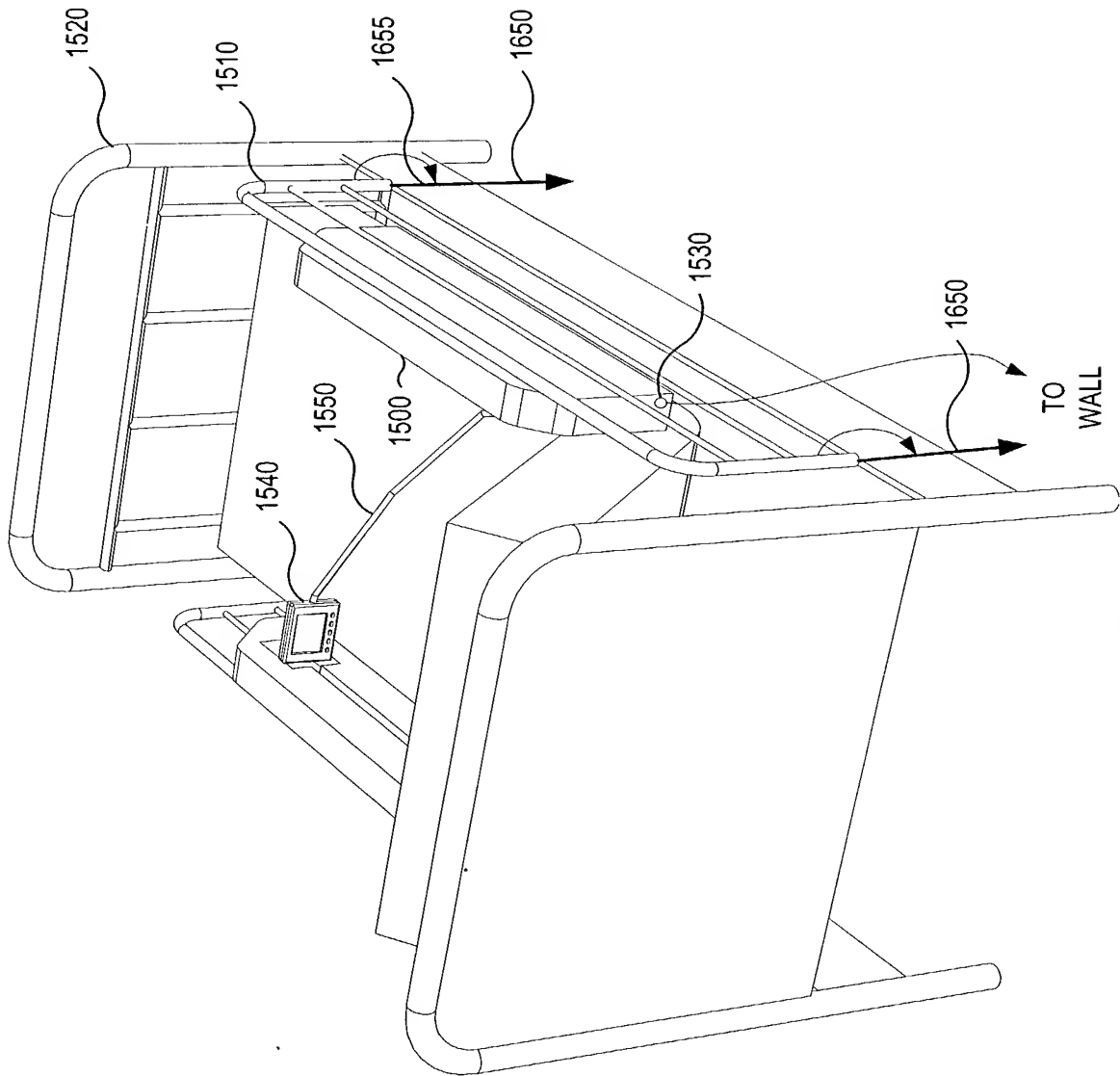


FIG. 25

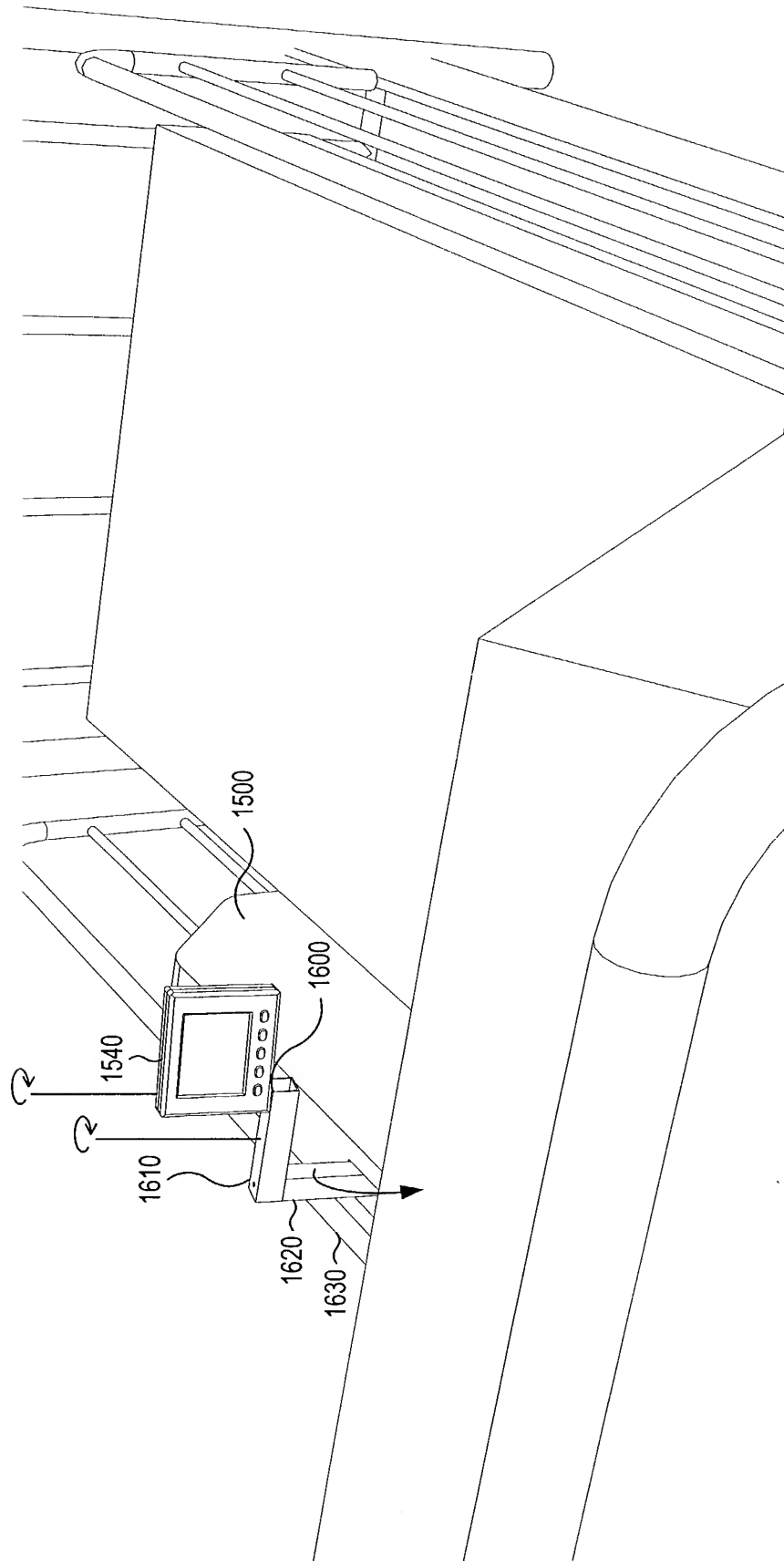


FIG. 26

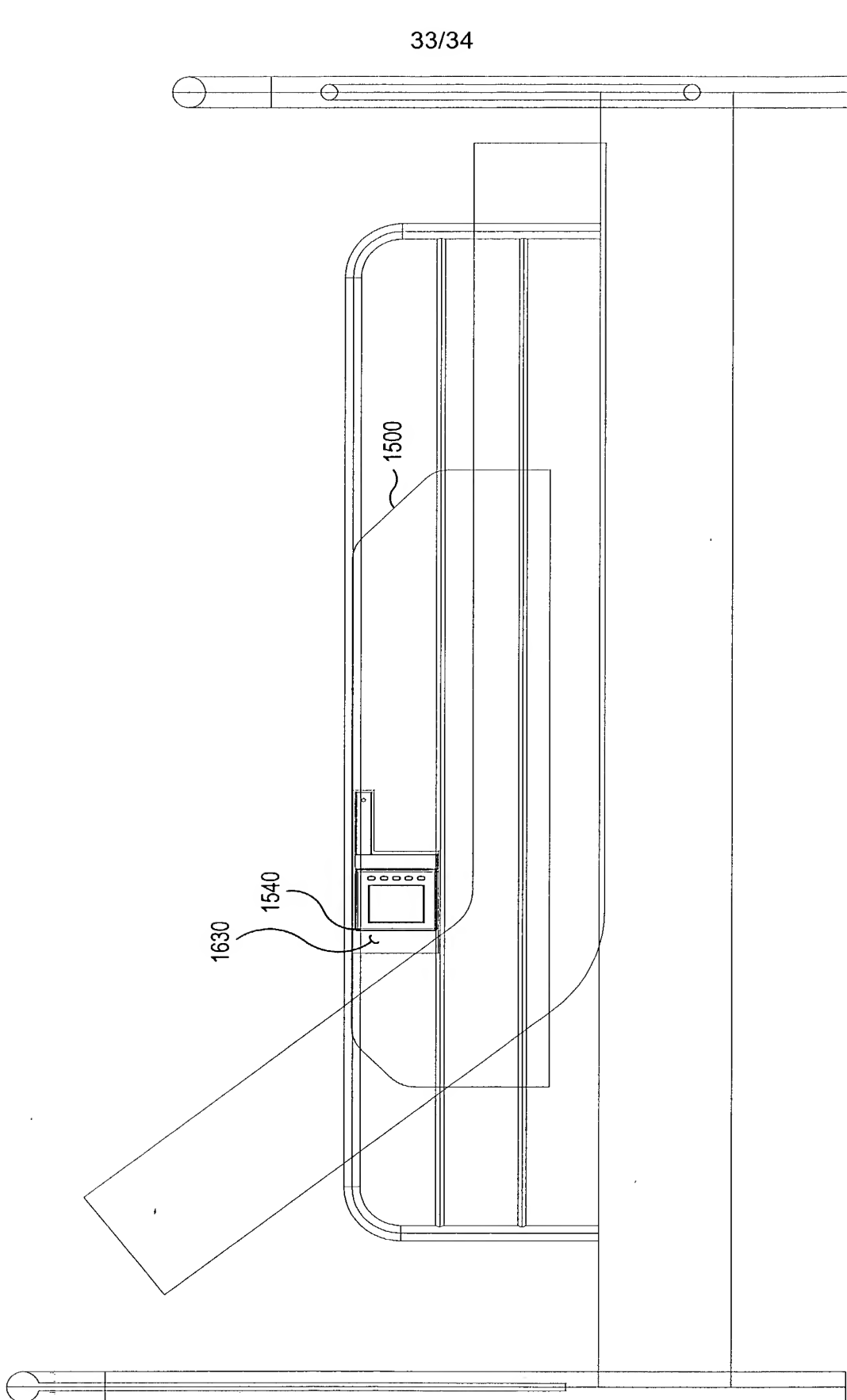


FIG. 27

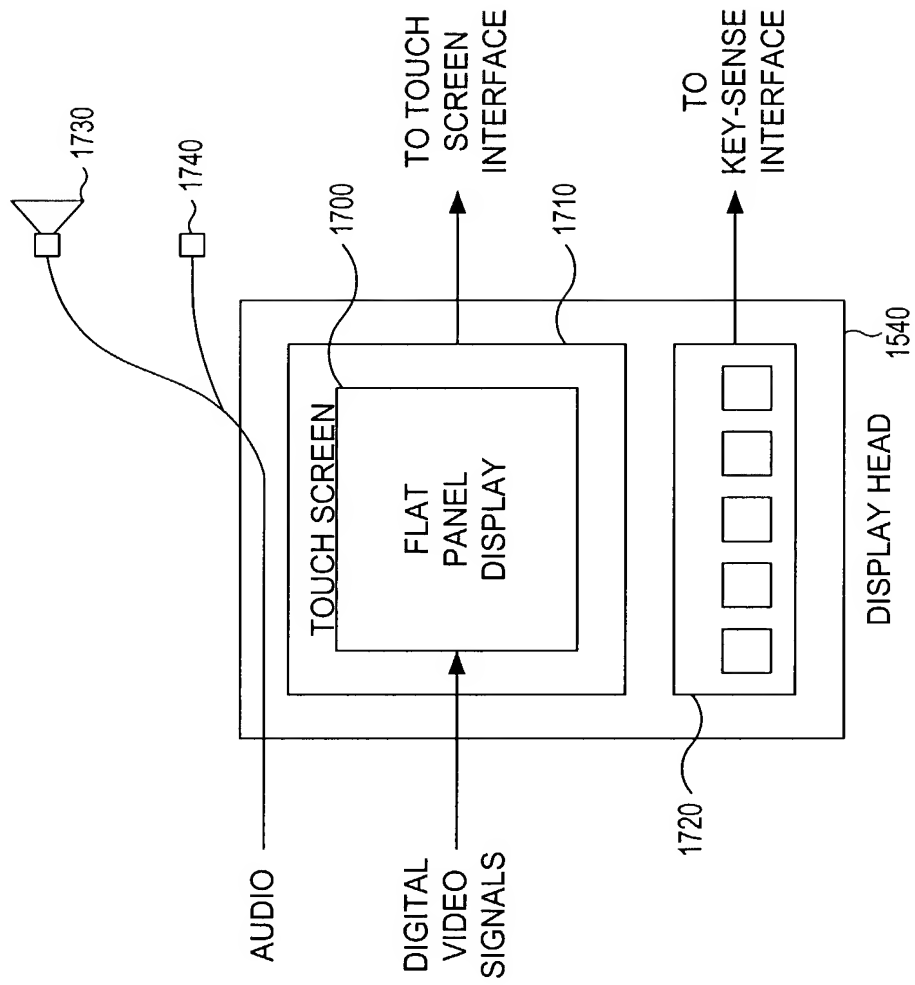


FIG. 28



DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION

(37 CFR 1.63)

Docket No.	JJ-001US
First Inventor	Jmaev
Application No.	
Filing Date	
Art Unit No.	
Examiner	

☒ Declaration Submitted With Initial Filing OR ☐ Declaration Submitted After Initial Filing; A surcharge Is Submitted Herewith in Accordance with 37 CFR 1.16(e)

As a below named inventor, I hereby declare that:

My residence, mailing address and citizenship are stated below next to my name. I believe that I, together with my co-inventors enumerated in the table below, are the first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Method and Apparatus for Delivering Dissimilar Entertainment

and Advertising Content to a Plurality of Subscribers

the specification of which:

☒ is attached hereto; or

☐ was filed on: _____ as United States Application Number or
(MM/DD/YYYY) PCT International Application Number _____

☐ This specification was amended on: _____
(MM/DD/YYYY)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above. I further acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Numbers	CNTRY	Foreign Filing Date	Priority Not Claimed	Certified Copy Attached?	
YES	NO				
PCT/US00/27480	PCT	10/04/2000	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please Direct All Correspondence to:

Jack I. J'maev, Reg. No. 45,669
Intellectual Property Development
12616 Lewis Avenue
Chino, CA 91710 USA

Office Phone No. (909) 517-3416
Office FAX No. (909) 517-3406
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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION

TABLE OF JOINT-INVENTORS
(First Named Inventor Enumerated First In Table)

NAME OF JOINT INVENTOR	RESIDENCE CITY	STATE	CNTRY	CITZ	MAILING ADDRESS
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Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					
Given Name					
Surname					

UI = Unsigned Inventor, Check Box Next to Name of Co-Inventor That Has Not Signed and A Petition Has Been or Is Concurrently Being Filed

I acknowledge that all persons named in the table above are joint-inventors of the subject matter which is claimed and for which a patent is sought.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Jack Ivan

Jmaev

Inventor Printed Name

Inventors Signature

Date

JJ-001US

Page 2 of 2

4/3/02